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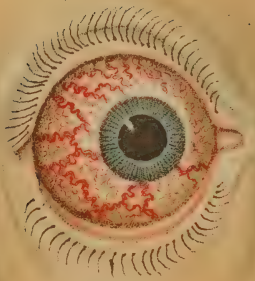
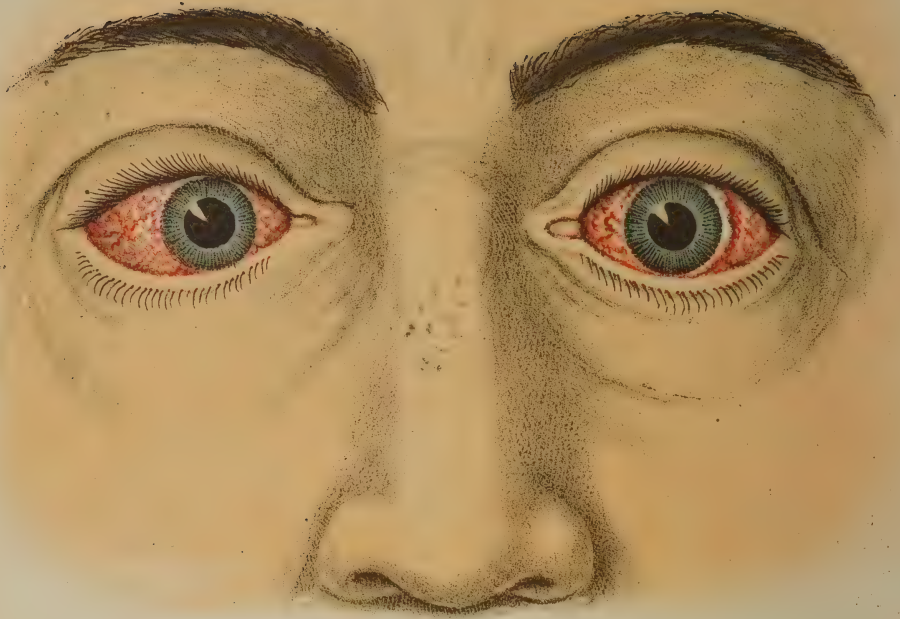
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Drawn by Miss Martha Washington.

F. Moras lith. Phil^a

Plate illustrating Dr. de Schweinitz's Case of Bilateral Exophthalmos.



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FEBRUARY, 1895.

[No. 1.

ORIGINAL COMMUNICATIONS.

BILATERAL EXOPHTHALMOS; HEMORRHAGIC NEURO-RETINITIS; PROBABLE INTRACRANIAL ARTERIO-VEINOS ANEURISM.¹

BY G. E. DE SCHWEINITZ, M.D.,

Clinical Professor of Ophthalmology in the Jefferson Medical College; Professor of Ophthalmology in the Philadelphia Polyclinic, etc.

JOHN T. J., aged forty-one, presented himself for treatment in the Jefferson Medical College Hospital on the 1st of January, 1894, and gave the following history:

On September 19, 1893, he was injured by the premature explosion of blasting-powder in a mine in Shamokin, and came under the care of Dr. Hollenbach, of that city, who very kindly sent him to Philadelphia for examination. The immediate result of the blow, which chiefly affected the right side of the head and the bridge of the nose, was unconsciousness, lasting for some hours. On recovery there was impairment of vision, probably due to diplopia. Three weeks later both eyes became prominent, and double vision and headache were marked symptoms. Bleeding from the nose or ears did not occur.

This bulging of the eyeballs continued to increase, and at the time of his examination, about fourteen weeks after the injury, the condition of affairs evident in the accompanying illustration (see frontispiece²) was present,—namely, marked bilateral exophthalmos; coarse injection of the posterior conjunctival veins, which coursed over the prominent eyeballs in a net-work of dilated, tortuous, and bluish vessels; convergent strabismus, the angle of squint being ten degrees; and limitation of the movement of the right eyeball outward, owing to paralysis of the external rectus upon that side.

¹ Read before the Philadelphia County Medical Society, October 24, 1894.

² The lower figure is from the same case with the eyelids widely separated.

The vision in each eye was $\frac{5}{6}$, the pupillary reactions were normal, the media were clear, the disks reddened, and the retinal veins distended, especially on the left side; the arteries were normal. A small patch of retino-choroiditis was visible beyond the right macula, and a pigment spot near the disk.

The patient's faculties were clear; the only symptom of which he complained, except the diplopia, was headache, at the time of the examination somewhat less marked than a few weeks after the original injury.

Careful inspection of the head and face did not reveal evidence of former fracture. He was placed upon ascending doses of iodide of potassium, and was referred to Dr. Hollenbach for watching and treatment.

He returned on the 26th of February, and presented the same symptoms already described, except that the headache was diminished, and, in fact, entirely absent for most of the time. The treatment of iodide of potassium was continued, and the patient was requested to report again at his earliest convenience.

In July he reappeared, stating that in addition to occasional attacks of headache, a roaring sound had developed in his head, which proved to be a strong bruit, synchronous with the heart's action.

In order to eliminate the possibility of connection between the prominent eyes and naso-pharyngeal disease, or lesion in the neighboring sinuses, he was sent to Dr. W. J. Freeman, who reported as follows: "I have examined your patient thoroughly, and find nothing indicating connection between the eye lesions and the nares. The antra, by the use of transillumination, appear perfectly clear and normal. The turbinals are sclerosed, and permit as good a view of the ethmoid and frontal region as it is ever possible to obtain, and everything appears normal there. There may be involvement of the frontal and ethmoid cells, such as purulent disease with retention of contents, or a tumor; but I can hardly think this would occur without giving intense pain. Percussion seems to show that the frontal cells are in a natural condition."

Examination of the ears did not disclose signs of disease.

The patient was again seen on the 29th of September, 1894, and now the symptom of which he had complained at the previous visit—namely, roaring in the head—was much more marked, as also were the exophthalmos and the hyperæmia and tortuosity of the posterior conjunctival veins.

Ophthalmoscopically the following lesions were present: *Right eye*.—Full, dark, and tortuous veins; macular choroiditis; small circular hemorrhages, with here and there pigment dots indicating former extravasations; one linear hemorrhage above the disk, and another up and out from it; optic disk itself hyperæmic, slightly swollen, and œdematous. *Left eye*.—Well-marked beginning optic neuritis; veins extraordinarily full and tortuous, especially the upper temporal branches; numerous circular hemorrhages most marked in the macular region, and slight œdematous swelling of the fibre layer of the retina throughout the fundus.

The noise in the head was likened to the puffing of an engine, worse when he stooped over and made any exertion, or when he was lying down and quiet at night.

He was admitted to the Jefferson Medical College Hospital for further study, and kindly examined by Dr. James C. Wilson, Dr. W. W. Keen, and Dr. Francis X. Dercum. Dr. Wilson's physical examination demonstrated the following points: A well-marked systolic murmur heard throughout the head at all portions, but especially notable over the right temple and at the occiput; also a basal systolic murmur over the heart, and a less marked murmur at the apex. No other vascular disorders were discoverable; the functions of the remaining organs of the body were normal.

Pressure upon the right carotid stopped the bruit entirely; compression of the left carotid diminished, but did not arrest it.

Briefly, then, the facts in regard to the present case are these :

A man, aged forty-one, in previous good health, is severely injured by an accident in a mine, causing unconsciousness, but no demonstrable fracture of the skull, the weight of the blow which produced the injury having spent itself chiefly upon the right side. Three weeks later there are exophthalmos, hyperæmia of the veins of the eyeball, paralysis of the right external rectus, and some passive congestion of the retinal circulation. Three months after this date the same symptoms obtain without change. Seven months later, in addition to the other symptoms, a roaring in the head, which in two months becomes so intense that it resembles the puffing of an engine, and optic neuritis and retinal hemorrhages are evident. This roaring, on physical examination, is found to be a well-marked systolic murmur, particularly noticeable upon the right side, worse in the recumbent posture and when any exertion is made. The exophthalmos and venous hyperæmia of the posterior conjunctival vessels remain unchanged, or perhaps slightly increase during the entire course of the case.

This case may be classified among those to which, in general terms, the name aneurismal proptosis, or, as Nunneley prefers, vascular protrusion, is applicable, and which usually, in addition to the exophthalmos, are associated with more or less marked pulsation.

Such phenomena may be due to aneurism of the orbit, and in the early observations this explanation appears to have been the only one suggested, although the recorders were not sure whether the lesion was a true aneurism, an aneurism by anastomosis, or an aneurismal dilatation of the ophthalmic artery in its whole course.

As knowledge increased it became evident that the same symptoms, and indeed in the majority of cases, were unassociated with disease in the orbit, but arose from intracranial causes, or, to quote Mr. Nunneley, "the protrusion of the eyeball is passive, and the other symptoms are secondary, and depend on obstruction to the return of blood through the ophthalmic vein." Rivington¹ demonstrated by his able analysis that proptosis, pulsation, and bruit may be due to extra-orbital aneurism of the ophthalmic artery, to aneurism of the internal carotid, and to aneurismal varix involving the internal carotid and cavernous sinus. The last-named lesion—viz., arterio-venous communication—is the one most frequently responsible for these phenomena. Thus, W. Adams Frost² analyzed the post-mortem examinations in nineteen cases, as follows: Orbital tumor in three, affection of the cavernous sinus in two, and aneurism of the intra-orbital portion of the ophthalmic artery in two. In the remaining twelve cases arterio-venous communication certainly existed in seven, almost certainly in an eighth case, while in the other four its presence could not be disproved.

¹ Medico-Chirurg. Soc. Trans., vol. lviii.

² Trans. of the Ophth. Soc. of the U. K., vol. iii., 1883, p. 15.

TABLE OF CASES OF EXOPHTHALMOS ANALYZED.

No.	Reporter.	Reference.	Side.	Sex.	Age.	Cause and Symptoms.	Treatment.	Result.
1	SROK	Revue des Scien. Médicales, 29, 1887, p. 656. Abstract reported in 1886.	Right.	M.	52	A fall on head; next day exophthalmos, followed by bruit, which was controlled by pressure of carotid.	Ligature of primary carotid.	Disappearance of the bruit and final replacement of the eye; atrophy of the optic nerve.
2	HENRY E. CLARK	Glasgow Med. Journ., vol. xxviii., July and Dec., 1887.	Right.	F.	46	Injury by fall on left side of face; no lesion on right side. Six days later exophthalmos and bruit; glaucoma and cataract.	First compression; later ligation of right carotid.	Compression failed; ligation stopped bruit, and four months later exophthalmos disappeared.
3	G. E. WALKER	Trans. Ophth. Soc. U. K., 1887, vol. vii. p. 124.	Right.	M.	15	Fell, striking forehead; insensible for three days; swishing noise in head on awakening; venous engorgement O. D. Six months later temporary venous engorgement O. S.; later proptosis, bruit, and pulsation continuing for four months.	Compression tried for only twenty minutes. Ligation advised.	After fright in crush caused by crowd, sudden cessation of bruit, but proptosis unchanged. Slow retrogression of symptoms. Reporter thinks aneurism was outside of sinus.
4	J. ECKERLEIN	Inaug. Dissert., Königsberg, 1887. Abstract Nagel's Jahresbericht, vol. xviii. p. 451.	Both.	M.	. .	Pulsating exophthalmos affecting both eyes in succession, which arose on account of an injury with a spike, which was driven through right orbit, causing an arterio-venous aneurism in the sinus cavernosus.	Ligation of the carotid.	Complete cure.
5	HAASE	Arch. f. Augenheilk., 1886-87, I, p. 25.	Right.	M.	52	Fall on head; unconscious; same day vomiting; later protrusion of right eye; diplopia; later pulsation.	Ligation of carotid.	Gradual cure, but sight remained poor from atrophy of disk.
6	NIEDEN	Arch. f. Augenheilk., xvii., 1887, S. 275.	Right.	M.	. .	Fracture of base of skull. Nine days later blindness and vertigo; one month later convergent strabismus, reactionless pupil; exophthalmos and pulsation; atrophy of optic nerve; paralysis of oculo-motor,	First digital compression; later ligature of right carotid.	Amelioration very marked. Later, however, there was return of bruit.

7	CARRERAS-ARAGO	Rev. des Scien. Méd., Barcel., viii. p. 97, 1887. Original not at hand.	. . . .	. . . .	Exophthalmos caused by traumatic aneurism of the ophthalmic artery.	abducens, and a branch of the tri- geminus.	Cure.
8	PRICHARD	Bristol Medical Chirurgical Journal, 5, 1887, p. 267.	. . . .	M. 10	Eye injured by umbrella wire. Six- teen days later pulsation, bruit, and exophthalmos.	Ice and compression of eyeball. Later ligation of com- mon carotid.	Primary stoppage of bruit and pulsation. Later return of bruit. At time of report eye red and prominent; bruit, but no pulse.
9	BULLER	Trans. Am. Oph- thalmol. Soc., 1888, p. 22.	Right.	M. 28	Patient injured by fall, striking right side of head and face; unconscious for twenty-four hours; after sub- sidence of swelling, diplopia and loud-beating sound in right ear; ten weeks later general appearance of eye suggestive of orbital cellu- litis, the inner extremity of eye- brow pulsating and swelling, and a rasping bruit, synchronous with ac- tion of heart.	Ligation of common carotid.	Seventeen days later pa- tient thinks himself cured. Except slight fullness of the orbit, no indication of recent or- bital affection.
10	J. W. HULKE	Trans. Ophth. Soc. U. K., 1888, vol. viii. p. 52.	Left.	M. 28	Five years before struck side of nose with wood; three weeks later prop- tosis and pulsation; ligation of carotid; later relapse; cavernous vessels solidified by galvano-punc- ture, final extreme proptosis, eye fixed, pulsation, and bruit.	Iodide of potas.; li- gation of carotid; galvano-puncture of cavernous ves- sels.	Failure; relapse after li- gation; treatment of dilated vessels with galvano-puncture two years after operation.
11	KIPP	Am. Journ. of Ophth., vol. v., 1888, p. 328.	Both.	F. 76	Double vascular protrusion of eye- balls as result of a fall on head three months previously. The usual symptoms of exophthalmos and bruit and pulsation were present.	Iodide of potassium and intermittent compression of carotid.	Cure; so successful as to permit of normal cata- ract extraction later.

No.	Reporter.	Reference.	Side.	Sex.	Age.	Cause and Symptoms.	Treatment.	Result.
12	ROSSANDER	Abstract Nagel's Jahresbericht, vol. xix., 1888, p. 526.	Right.	M.	.	Injury from blow on head, causing probable fracture of base of skull and rupture of carotid into sinus cavernosus. Exophthalmos, pulsation, double vision, etc. Compression of carotid stopped pulsation.	Ligation of right carotid.	One month later no pulsation, but right eye was more prominent than left.
13	BRONNER	Ophthalmic Review, 1889, p. 23.	Right.	M.	66	Injury to head when one year old; immediate exophthalmos of right eye, and pulsation and bruit; continued ever since.	None detailed.	Symptoms continued unchanged for sixty-five years.
14	BENSON	Ophthalmic Review, viii., 1889, p. 309.	Right.	M.	38	Wound of right eye, followed by exophthalmos two months later, which was very marked nine months later; bruit, etc.	Compression of right carotid.	Cure.
15	EISEN	Arch. f. Augenheilk., xxi., 1889, S. 75.	Right.	F.	21	Exophthalmos appeared suddenly after spell of vomiting, and sight was suddenly lost; eye motionless; tension raised; vitreous clouded; optic nerve atrophied; pulsation of upper lid; auscultation revealed bruit. Compression of right carotid produced lessening of symptoms.	Ligation of common carotid; later ligation of internal carotid, superior thyroid artery, external carotid, ascending pharyngeal artery, and a second ligation of the common carotid.	Primary ligation of carotid, followed by cessation of pulsation and bruit. No change in exophthalmos. Later increase of exophthalmos and ligation of other arteries described. Still later eye enucleated, revealing a pulsating mass in the orbit, which later ceased altogether. The diagnosis of rupture of ophthalmic artery was made and a special brittleness or symptomless aneurism assumed.
16	HIRSCHBERG	Deutsche Medi-	Right.	M.	25	One year before examination blow	Compression will be	No result of treatment re-

17	KRETSCHMER	cinisch. Woehenschrift, vol. xv., 1889, p. 295.	Right.	M.	42	upon right temple; about seven months later relapsing swelling of right under eyelid; exophthalmos; unusual widening of veins of sclera; double vision; bruit. Compression stops the bruit.	tried. No details given.	corded. A diagnosis of traumatic aneurism was made.
		Centralblatt f. prakt. Augenheilk., April, 1889, p. 112.				Right eye injured by a shot which passed through inner corneal border; four weeks later in region of supra-orbital notch, pulsation, swelling; auscultation revealed a continuous murmur, which was stopped by pressure of carotid.	No treatment detailed.	Reporter thinks that shot produced a lesion of the carotid in the cavernous sinus.
18	NAYLOR	Australian Med. Gaz., 1889, p. 118.	Both.	F.	60	No injury; repeated epistaxis for fifteen years; exophthalmos of right eye, pulsation, ptosis, and bruit. A year later again epistaxis, followed by protrusion of left eyeball.	Rest; iodide of potassium; occasional pressure over the right carotid.	Case still under observation.
19	LE FORT	Rev. de Chirurg., 1890, p. 368.	Both.	F.	18	Injury with blow from hoof of horse; unconsciousness, followed by double sight; thirteen days later double exophthalmos, especially on right side; paralytic convergent strabismus and strong pulsation of right eye; filling of subconjunctival veins; marked bruit. Compression of right carotid stopped the symptoms.	Ligature of right carotid; later also of left. Operation on right carotid was followed by ligature of left, because of the strong left-sided exophthalmos, which followed the operation.	Sixteen months after the second operation there was cessation of the bruit and only a slight exophthalmos.
20	P. POIRIER	Arch. Gén. de Médecine, 166, 1890, 2, p. 513.	Right.	M.	.	Ten years before injured with revolver bullet in parotid region; exophthalmos of right eye; bruit, etc.	Ligature of common carotid.	Amelioration.
21	W. H. BATTLE	Lancet, 1890, 2, p. 57.	.	.	.	In a lecture on injuries of the head, quotes four cases, without more particulars, in which, associated with fracture of skull, there was found decided exophthalmos.		

No.	Reporter.	Reference.	Side.	Sex.	Age.	Cause and Symptoms.	Treatment.	Result.
22	KALT	La Semaine Méd., 11, 1891, p. 236.	Left.	M.	34	Blow on occipital region; one month later exophthalmos of left eye; bruit synchronous with systole of heart, etc.	First digital compression; ligature of left carotid.	Primary amelioration. Later Panas (Gaz. des Hôp., 64, 1891, p. 952) refers to this case as not cured by the operation.
23	RICHARD WILLIAMS. ¹	Trans. Ophth. Soc. U. K., vol. xi. p. 31, 1891.	Left.	M.	14	Kick from horse over left temple, and left eye has since been swollen; proptosis; filling of conjunctival veins; pulsating swelling at inner angle of orbit; bruit synchronous with the pulse arrested by pressure upon carotid; great distention of retinal veins.	Ligature of common carotid.	Immediate result, arrest of the pulsation and disappearance of the dilated veins. Later return of pulsation, gradual diminution of the pulsation and proptosis. Three months after operation there was no pulsation, and vision was normal.
24	MÜLLER	Inaug. Dissert., Halle, 1891. Abstract Nagel's Jahresbericht, vol. xxii. p. 416.	Right.	M.	15	Shot in right eye with toy pistol; immediately after the accident the uninjured globe appeared almost dragged out of the orbital cavity. There was loss of consciousness and paresis of left leg. Eyeball became sloughed and was taken out. Patient complained of noise in head, which was found to be a systolic murmur.	. . . . .	A direct communication between the carotid and the sinus cavernosus was diagnosed.
25	MÜLLER	Ibid.	Both.	M.	4½	Injury with time of fork in right eye, so thrust that it probably burst the orbital walls and caused rupture of carotid in the cavernous sinus; bilateral exophthalmos; dilatation of the veins; no pulsation; but marked systolic murmur throughout head.	Ligature of common carotid.	Cure.

¹ In this paper several other cases of pulsating exophthalmos are referred to,—three by Mr. Tatham Thompson, two of which occurred in children, and were traumatic in origin, probably intra-orbital, treated, and practically cured by electrolysis. Since these tables have been constructed a case of pulsating exophthalmos (congenital) is reported by Ernest Clarke (Trans. Ophth. Soc. U. K., vol. xiv., 1894, p. 202), and several additional traumatic cases are referred to in the discussion.

26	J. F. BULLAR	British Medical Journ., 1891, 2, p. 597.	Right.	F.	38	Strong pulsation of right eye and diplopia; no history of injury or accident; no bruit.	Ligation of common carotid.	Fourteen months after the operation protrusion no longer noticeable except upon close observation. Vision, which was previously $\frac{20}{200}$, has risen to $\frac{20}{40}$. Patient has been at hard labor.
27	P. B. WING	Arch. of Ophthalmology, vol. xx., 1891, p. 548.	Right.	M.	22	Injury by falling on head, probably causing fracture of base; five months later beginning exophthalmos, slowly progressive; pulsating tumor at upper and inner angle of orbit.		
28	ISRAEL	Deutsche Medicinisch. Wochenschrift, vol. xvii., 1891, p. 1383.	. .	. .	. .	A patient, sex and age not given, and no cause recited, had pronounced exophthalmos and tumor in the temple region; according to the author, probably a retro-bulbar cavernoma.		
29	DUBOISSON	L'Union Médicale, Dec., 1892. Abstract Nagel's Jahresbericht, vol. xxiii. p. 500.	Both.	M.	. .	Arterio-venous aneurism of the carotid, with exophthalmos of left eye at first, following pistol wound of mouth; five months later left exophthalmos, pulsation, diplopia, and bruit, the right exophthalmos had in the mean time subsided.	Compression of the carotid reduced the exophthalmos and the bruit, but it is not stated that the treatment was pursued.	No statement.
30	NISSEN	Abstract Centralb. f. prakt. Augenheilk., vol. xvi., 1892, p. 62.	Both.	. .	. .	Patient received a blow with a pitchfork against the right upper eyelid; double exophthalmos, greater upon the right side; venous stasis; double paralysis of the abducens; right-sided optic neuritis and pulsation.	Ligation of the right common carotid.	After fourteen days marked improvement, and seven days later, only on the right side, some exophthalmos.
31	WOELFLER	Ibid. . . . .	. .	. .	. .	At the same time that Nissen reported his case, Woelfler records a case of traumatic pulsating exophthalmos; no further particulars.	Compression of the carotid.	Cure in eight days.

No.	Reporter.	Reference.	Side.	Sex.	Age.	Cause and Symptoms.	Treatment.	Result.
32	PULVERMACHER	Centralblatt f. prakt. Augenheilk., vol. xvi., 1892, p. 330.	Left.	F.	12	Two years before examination fell striking left temple, causing unconsciousness. At that time the diagnosis of basal fracture was made; half a year after the accident exophthalmos of the eye was observed. When examined prominent exophthalmos and prominent veins in the lids, temple, and cheek. Upper and inner portion of the orbit pulsation synchronous with the radial pulse, which was checked by compression of the carotid.	Ligation of the left common carotid.	Reporter thinks this case cured, although half a year after the operation there was still some slight bruit to be heard with the stethoscope, and moderate exophthalmos. The other phenomena, however, had markedly disappeared.
33	CLARKE	Trans. Glasgow Path. and Clin. Soc., 1892, iii. 62-65.	Right.	F.	46	Same as case No. 2.		
34	PROQUÉ AND DESPAGNET	Bull. et Mém. de la Soc. de Chir., Paris, N. S. 19, 1893, p. 303.	Right.	F.	60	Injury by a carriage accident, probably causing fracture of base of skull. Right side pulsatile exophthalmos.	Compression.	Amelioration.
35	R. A. REEVE	Trans. Amer. Ophth. Soc., 1893, p. 605.	Right.	M.		Injury by a kick from a horse on inferior border of inferior maxilla of right side; two days later noise in right ear; a few days later convergent squint and diplopia; and four weeks after the accident, prominent right eyeball, swelling of veins, and thrashing noise in head; proptosis so marked that eyelids cannot be brought together.	Potassium iodide, digitalis, and ergot. Compression of the right carotid, followed by slight decrease of displacement. This treatment kept up from October to February, at which time there was little	Primary cessation of bruit and pulsation, which returned, however, in a few hours. After healing of wound, pressure tried again. The result imperfect. Pressure on right carotid stops pulse and bruit, but second operation had not yet been performed at time of report.

36	G. E. WALKER	Lancet, 1894, 1, p. 191.	Right.	F. 42	Injured by a fall causing scalp wound on left side of occipital protuberance; three days later eye tender and noise in head; two days later beginning exophthalmos; eye blind.	Improvement. Ligature of common carotid, February 14.	Cessation of murmur and patient doing well three weeks later.
37	F. H. KNAGS	Lancet, 1894, 1, p. 857.	Left.	F. 24	Twenty-nine hours after delivery stabbing pain in left orbit followed by buzzing noise in ear and later proptosis; later pulsation and a loud blowing murmur.	Rest, iodide of potassium; leeches to the temple; no improvement; later ligature of left common carotid.	Cure of proptosis, etc.; sight, however, destroyed, due to glaucoma. Author thinks the diagnosis lies between true aneurism, arterio-venous aneurism, and thrombosis of the cavernous sinus.
38	VALUDE	Bulletin Méd., Paris, 1894, viii. 375-378.	. .	. . .	A clinical lecture on diseases causing exophthalmos; no separate cases detailed.		
39	DE SCHWEINITZ . . . .	. . . . .	Both.	M. 41	Blow on right side of head from premature explosion of blasting powder; unconsciousness; palsy of external rectus; three weeks later exophthalmos, venous hyperemia of the veins of the eyeball; seven months later systolic bruit; retinal hemorrhages and optic neuritis.	Iodide of potassium, rest, and intermittent pressure on the common carotid; ligature advised, but declined.	No improvement in the exophthalmos as yet reported; considerable amelioration of the headache.

SUMMARY OF THE TABLE.

No. 33 is a repetition of No. 2, and No. 38 a clinical lecture without the report of a new case.

Males	22	Right side affected	19	Traumatic cause	32	Ligature of common carotid	21	Ligature resulted in: Cures	12
Females	10	Left side affected	5	Other causes	4	Compression	7	Amelioration	5
Sex not named	5	Both sides affected	8	No cause named	1	No treatment detailed . .	9	Failure or imperfect result .	4
		Side not named	5						

The literature of the subject is large. The most important monograph which has appeared is the one by Sattler,¹ in which one hundred and six cases are classified, based upon the records to the middle of 1880. Since then several papers have been published containing extensive bibliographies; for example, the articles by W. Adams Frost,² Koehler,³ Nieden,⁴ and Le Fort.⁵ The bibliography of the last-named paper is practically a repetition of that contained in Sattler's collection. Koehler's cases are included in Nieden's list, which contains all of the reports since Sattler's monograph appeared.

The cases not classified in the lists already referred to, thirty-seven in number, I have gathered in the form of the tables which accompany this paper, and which are to be found printed on the eight preceding pages.

The total number of cases is one hundred and eighty-one. Traumatism is responsible for the majority of them, being the essential cause in about sixty per cent., or one hundred and ten times in one hundred and eighty-one records. Sometimes the injury has been inflicted directly in the cavernous sinus, for example, by a pistol-ball, or by the thrust of a sharp instrument penetrating the orbit, and sometimes indirectly by a fracture at the base of the skull so situated as to involve this region.

Ordinarily the exophthalmos is unilateral, appearing on the same side as the lesion, but bilateral vascular protrusion has been noted in a number of instances, occurring, for example, four times in Sattler's collection of fifty-nine traumatic cases, and eight times in my own. Bilateral exophthalmos develops because the traumatism—for example, a fracture at the base of the skull—establishes a communication between the internal carotid artery and the cavernous sinus upon one side, leading to distention or varicose dilatation of the orbital veins. Later there is extension of the process by the transverse and circular sinuses to the venous channels upon the opposite side. This theory, so stated by Mr. Adams Frost to explain his case of double pulsating exophthalmos, is applicable to most of the cases exhibiting similar phenomena.

The rupture of the arterial wall in the cavernous sinus is followed by increased pressure within this venous channel, which retards the current in the orbital veins, but pulsation, so marked in most of the cases, may not necessarily be an early or a constant symptom. It probably does not begin, as Sattler originally demonstrated, until, after dilatation of the veins, the blood-current is reversed and arterial blood flows through them. I have little doubt that the phenomenon of pulsation will appear in this case also; in fact, as I exhibit the patient to-night, careful pressure over the left eye

¹ Graefe und Saemisch, *Handbuch d. Augenheilk.*, Bd. vi. 745-948.

² Loc. cit.

³ *Deutsch militärische Zeitschrift*, 1886. See also *Berlin. klin. Wochenschr.*, xxiii. S. 550. See also Nagel's *Jahresbericht*, vol. xvii. p. 562.

⁴ *Archiv f. Augenheilk.*, 1886-1887, vol. xvii. pp. 275-287.

⁵ *Revue de Chirurg.*, vol. x., 1890, p. 481.

gives the impression of a slight impulse or shock communicated to the examining hand. The impulse, however, is not visible.

Paralysis of the abducens, passive hyperæmia of the veins in the eyelids and subconjunctival tissue, as well as of those in the retina, the latter often being unusually distended and tortuous, are frequent symptoms. Optic neuritis and retinal hemorrhages, as in my own case, have also been recorded, but not so commonly as the other ocular symptoms. Blindness as a consequence of optic nerve atrophy, glaucoma, and opacities in the media, particularly cataract, have been described several times. In two or three of the cases the cataract has been successfully removed after appropriate treatment had diminished or cured the exophthalmos, notably by Kipp and Buller.

In the treatment of these cases, provided we deal with a true aneurism or aneurismal varix, and not with a vascular tumor, ligature of the common carotid in the neck yields the best results. This operation was performed on sixty-three of the one hundred and six patients in Sattler's collection, on eighteen of the thirty-eight in Nieden's list, and on twenty-one of the thirty-seven in my analysis, or on one hundred and two among the one hundred and eighty-one cases,—that is to say, on 50.6 per cent. of them.

Excluding pulsating angioma and sarcoma, there were eight deaths among Sattler's sixty-three cases, or 12.7 per cent. ; Nieden finds three fatal cases, but their deaths, according to him, are not attributable to the operation ; in my own collection of twenty-one operations there are no deaths. Mr. Frost,¹ who has examined the records of sixty-three cases of ligature, practically the same ones as those included in Sattler's monograph, states the results as follows : "Thirty-one were cured at once, and, as far as is known, permanently ; three were partially cured ; in thirteen a relapse occurred, but a cure was subsequently effected by other means (in two by ligature of the other carotid). In one no effect was produced, and in Velpeau's case, in which both orbits were affected, a relapse occurred in one. Fourteen cases were fatal ; seven from the effects of the operation ; one after galvanopuncture performed for a relapse ; the remainder from causes unconnected with the operation."²

Granting that the three deaths which Nieden records were due to the operation, although the reporter contends they were not, we have but eleven deaths in one hundred and two operations of ligature of the primary carotid for the relief of pulsating exophthalmos, or, in other words, a mortality of 10.7 per cent. It should be remembered, however, that the earlier operations were done without the advantages of aseptic surgery, hence the mortality is higher. Thus, following the operations performed

¹ Loc. cit.

² Le Fort, who goes over similar ground, gives the results of ligature of the carotid as follows : Complete cure, 34 ; partial cure, 4 ; relapse or imperfect success, 14 ; complete failure, 2 ; death, 8.

since 1880, thirty-nine in number, on seventy-five cases, there has not been a single death, provided it is admitted that the three fatalities found in Nieden's collection should not be attributed to the operation. There is no doubt that since 1886, among twenty-one cases of ligature of the common carotid, there has been no death.

The other measures that particularly commend themselves for the relief of this affection are rest; the administration of full doses of iodide of potassium, with some restriction of diet, after the manner of the Tufnell treatment for aneurism; and compression of the common carotid, either intermitting or continuous, the latter being a very difficult procedure on account of the anatomical relations of the vessel. Nieden found seventeen cases treated with digital compression, and in seven of my own list this was the chief treatment, resulting in four cures, one amelioration, one failure, and one with the effect not reported. In a number of the cases in which the common carotid was subsequently tied, compression had at first been attempted without favorable result.

This, it seems to me, should be the order of procedure: Compression with or without the administration of iodide of potassium; in the event of failure, ligature of the common carotid, which may be recommended to the patient because, as Knapp has tersely said, "it cures most of the cases," and the risk to life is exceedingly small. I am in accord with the advice of several surgeons that ligation should be early considered in the treatment of these cases. Compression or medicinal treatment should be regarded as insufficient unless signs of amelioration promptly appear.

The patient whose case I have reported this evening has been advised to submit to the operation of ligature of the common carotid upon the right side. Thus far, however, he has declined what seems to me to be the only hope for him, especially on account of the extensive changes in the eye-ground which are likely at any time to lead, if not to permanent blindness, at least to such disability of vision as to render his life useless. In the mean time he has been directed to abstain from exertion, to take iodide of potassium, and to make compression of the carotid as far as this is possible.

THE SUSTAINED PULSE-TENSION OF MITRAL STENOSIS:
A SUGGESTION AS TO ITS CAUSE.

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THE earliest mechanical result of a narrowing of the mitral valve is hypertrophy of the left auricle and of the right cavities of the heart. This is part of the compensation which is gradually established *pari passu* with the stenosis, and which lasts for varying, and often for long, periods. The signs and symptoms of the disease do not, however, assert themselves until a further stage is reached, that of left auricular dilatation, with secondary dilatation also of the right ventricle and auricle. These later changes I venture to regard as the indirect cause of the pulse peculiarity now under consideration; and among them none is probably so actively concerned in this causation as the dilatation of the left auricle, to which we shall presently revert under the heading of "Pressure Effects."

THE PULSE IN MITRAL STENOSIS PRIOR TO CARDIAC FAILURE.

The following observations should be understood to apply only to the purer cases of this valvular affection throughout its stage of full development, and so long as the heart succeeds in maintaining a *modus vivendi*; for in cases complicated by other cardiac lesions, especially by considerable mitral regurgitation, and in all cases during the period of cardiac exhaustion, the distinctive pulse features are lost; indeed, they are usually replaced by the opposite peculiarities. Leaving aside, then, all exceptions, the rule is that the pulse of mitral stenosis, although not a large pulse, possesses decidedly sustained tension and a steady, moderate rate. Both to the finger and in the sphygmogram it presents a striking similarity with the pulse of aortic stenosis. Thus the pulse-trace shows the same oblique ascent, the same broad summit, the same curved, "round-shouldered" down-stroke, and last, but not least, often the same anacrotic notch. In a word, it is, on a smaller scale, an almost exact imitation of the sphygmogram of aortic stenosis. I long wondered how valvular conditions so dissimilar could lead in the pulse to results so strictly parallel. Specially puzzling were the immoderate length and struggle of the systole, so clearly displayed in the pulse and in its tracing, although so unlikely, one might have thought, to result from a lesion the main effect of which is rather to reduce than to increase the volume of the ventricular charge, whilst it interposes no obvious impediment between the ventricle and the arterial system.

Explanations based upon the operation of some peripheral cause, either of a purely mechanical nature, such as a constriction of the smaller vessels in sympathy with a lessened supply of arterial blood, or vaso-motor in connection with some assumed nervous agency, were admittedly lame and unsatisfactory, and their weakness seemed to add strength to the notion that the cause must be a definite one, and one acting centrally.

At last a rational explanation was arrived at, which possessed at least an element of probability in having for its basis the lesion which we regard as being specially characteristic of mitral stenosis, and the special effects of which we shall now briefly consider.

THE PRESSURE-EFFECTS DUE TO DILATATION OF THE LEFT AURICLE.

When the left auricle dilates, various consequences may arise with which this paper cannot pretend to deal exhaustively. Their common peculiarity is that they are mechanically inevitable, as a result of the deep situation and of the close attachments of this auricle, which deprive it of spare space and do not permit it to suffer much enlargement without pressure being set up somewhere. The most important among them, as well as the most obvious, are those exerted on the lung and bronchi.

1. *On the lung* the pressure is a direct one. The auricular enlargement takes place mainly at the expense of the left lower lobe. The compression or collapse and catarrh which result at the posterior base of this lobe are particularly well marked in the small chests of children. The bronchial tubes within the lung also bear some of the pressure.

2. Less generally noticed is the fact that the entry of air into the left lung is further restricted by the partial flattening of the *left main bronchus*. I have not succeeded in tracing any mention of this compression of the bronchus by the dilated auricle further back than King's contribution to the Guy's Hospital Reports (vol. ii., 1837, p. 121). King had not only recognized the anatomical condition, but he states that he had "frequently prognosticated it during life." Since that period little attention has been given to this serious and too frequent complication. From time to time it has been brought up again as an original observation by various pathologists, including the writer. It is to be desired that we may become better acquainted with its symptoms, and better able to detect and demonstrate its presence clinically.

The pulmonary collapse, which is a joint product of these pressures, is readily identified by physical examination during life. Thus the left posterior pulmonary base, during the stage of urgent symptoms, may be almost silent and dull from compression, and the breath-sounds may be much diminished at the back of the left upper lobe; but normal respiration will return into both lobes if the dilated right cavities should again decrease, and relieve by so much the pressure transmitted by the left auricle.

3. A special form of breathlessness arises in connection with the pressure

of the left auricle on the *œsophagus*, and is the source of much distress to the sufferers, whose feelings are expressed by a strikingly definite and uniform complaint that "the wind meets the food." This appears to be an accurate statement of the facts, since any previous pressure bearing upon the bifurcation of the trachea or the left bronchus would be much aggravated at the moment of the passage of food. Indeed, it was by this clinical symptom that I was led to search for the anatomical change in question.

4. Other pressure-effects, hitherto, I believe, unnoticed, are exerted in the heart itself and on the *aorta*. Their consideration forms the special object of the present communication.

In its progressive dilatation the auricle tends to enlarge in definite directions. Confined under the bifurcation of the trachea (which, though it may suffer slight displacement upward, is, owing to the arch of the aorta and for many other reasons, practically a fixture), and steadied in front by the contents and walls of the heart, the left auricle finds its opportunity for expansion downward and backward. Whilst normally, as pointed out by Sibson, this auricle occupies a median position, with slight prevailing inclination to the right, in mitral stenosis, any further encroachment towards the right is prevented by the simultaneous dilatation of the right auricle. *Laterally*, therefore, the dilatation occurs exclusively towards the left, and the pressure thus set up takes effect, as described above, on the left lung. The downward pressure and the backward pressure have yet to be discussed.

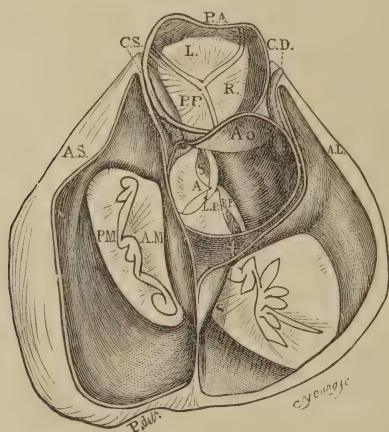
(a) Let us consider, in the first place, the *downward* enlargement and the downward pressure. The dilatation of the left auricle is largely, though not exclusively, brought about by the stretching of its posterior wall. Whilst its summit, together with the orifices of the pulmonary veins, maintains its relation to the root of the lungs, its vertical diameter increases, and the central part of the diaphragm is depressed by so much. But the maximum vertical increase occurs in the axis of the *mitral orifice*. The mitral membrane, especially its anterior segment, is stretched, often to a considerable extent, by the accumulation and pressure of blood within the auricle, and to that extent it is protruded into the ventricle, forming a palpable encroachment on the ventricular space. If we compare the internal aspect of the ventricle in this condition with that of a normal one, we can hardly have any doubts as to the detrimental influence of the mass thus protruded. Its presence alone is an encumbrance. Its bulk and resistance must interfere with a perfect approximation of the cardiac walls, and can only impede and delay their contraction.

Irrespective, however, of the general obstruction which it occasions, the mitral funnel seems to be also responsible for a direct interference with the aortic blood-supply. Physiologists are now agreed that the space immediately beneath the aortic valve is the last part of the ventricle to undergo systolic contraction,—indeed, that it is never completely obliterated as a space. By this arrangement not only the due direction but a steady progress of the ventricular outflow is insured. Functionally during systole this space

might almost be regarded as an intraventricular segment of the aortic channel, as the *caput aortæ*. It is precisely in the neighborhood of this useful space that the mitral tumor develops. During systole this relation of vicinity becomes one of actual encroachment, for the first result of the contraction of the circular fibres of the left ventricle will be to push the whole mass towards the septum and across the space in question. Thus the energy of the systole would be driving an obstruction into the cardiac outlet, and therefore rendering the escape of blood more laborious and more lengthy. It has been necessary for purposes of clearness to select for description a well-marked degree of this form of trouble; but in all cases of marked mitral stenosis it would appear at least likely that the deformation and increased bulk of the valve would take effect in the direction suggested rather than in any other, and that therefore this complication may be regarded as the rule rather than the exception.

(b) There is, however, another way in which the aortic supply is mechanically obstructed, the systole protracted, and the pulse-tension raised as a result of the great size of the left auricle,—viz., in connection with the increase in its *antero-posterior diameter*. Indeed, I attach much more etiological importance, in this attempted explanation of the protracted systole and pulse tension, to the pressure exerted on the *aorta* itself just beyond the valves; for, as we shall see, this pressure is direct and hydraulic, and from it there is no escape.

Professor Leo Popoff's paper in the *Berliner klinische Wochenschrift*, May 15, 1893, of which I find an abstract in the *British Medical Journal's* epitome of current literature for June, 1893, bases an ingenious explanation for the disappearance or great diminution of the right radial pulse in



Section through the base of the heart above the valves, illustrating the relation of the aorta, Ao, to the pulmonary artery and to the auricles and their appendages.

advanced mitral stenosis with tricuspid regurgitation, on the pressure put upon the innominate artery by the distended vena cava and its branches;

but the bigger pressure results which the aorta itself might suffer appear to have escaped his notice.

The accompanying view of a section through the base of the normal heart at right angles to the plane of the septum shows how the aorta at its origin is backed by the auricles, and flanked by the auricles and their appendages, whilst the infundibulum and pulmonary artery cover it in front. This arrangement is admirably adapted for the purposes of the normal function; for the distention of both vessels by the ventricular systole is so timed as to coincide with the period when the auricles, although filling again, are not quite full, and can afford room for the systolic arterial expansion. At the moment when the latter reaches its maximum the auricles suddenly relieve themselves into the ventricles through their wide orifices.

In mitral stenosis the relations of the origin of the aorta differ in one important particular from those illustrated above. So marked is the increase in the transverse diameter of the left auricle that the auricular septum and the right auricle are removed from immediate contact with the aorta, the posterior relation of which is now exclusively formed by the left auricle, itself closely applied, in the middle line, to the œsophagus and to the vertebral column.

These abnormal conditions materially interfere with the systolic mechanism; the fine alternation and reciprocity of pressure are disturbed; permanent lateral pressure is now kept up on the aorta instead of an intermittent one, and the close investment of the aorta is no longer a source of help, but becomes a hinderance. Not only is the left auricle kept constantly charged,—this is attested by this conspicuous dilatation,—but pressure is maintained on its right side by the distention and pressure of the right auricle. After death, the previous existence of pressure within the latter may not always be manifest, owing to post-mortem changes and to accidental escape of blood from the vessels and heart cavities; but the clinical evidence based upon the permanent distention of the jugular veins is sufficiently conclusive. Had the right auricle remained of normal size the effects of the left auricular dilatation would not have been so telling; finding sufficient room on the other side, the aorta might have receded and escaped undue pressure; but, as we have shown, there is counter-pressure on the right opposing any systolic swerving of the vessel towards that side. Again, in front, there is no opportunity for any locomotion of the vessel, for at the same moment the overcharged and distended pulmonary artery, the fulness of which is evidenced by its thumping second sound, claims more than its normal space and closes from the front around the aorta the investing circle of pressure which entirely deprives that vessel of the space normally reserved for its systolic expansion.

Without straining these observations, the conclusion seems to be warrantable that the systolic current is more or less hampered by the lateral pressure of the auricles and of the pulmonary artery. The aorta is caught as it were between the anvil and the hammer. The pressure within it can-

not fail to be raised ; but it is also obvious that part of the additional pressure must be distributed to the auricle behind and to the pulmonary artery in front, thus contributing to the loudness of the pulmonary second sound.

We have no evidence that the aorta is compressed to a smaller diameter than its proper average ; nevertheless the ventricular systole must encounter more than the normal resistance to aortic expansion, and must be prolonged by so much.

The fact that ventricular hypertrophy, which might have been expected, does not occur, is not an absolute objection to the correctness of these views. We should remember that, although there may be virtual aortic stenosis, this narrowing never approaches the degree observed in valvular aortic constriction. Moreover, in mitral stenosis the ventricle is, in a sense, always equal to its work, because the ventricular contents are relatively diminished by the mitral constriction, and the average pressure and fulness of the aorta and of the arterial system are also kept low. Thus, each ventricular systole, though it may be slowed and slightly labored, can always dispose of that amount of blood which it is called upon to propel.

(c) To the pressure-effects *backward* a very brief allusion will suffice, for they have been partially discussed under previous headings. Behind the left auricle lie the œsophagus and the bodies of the vertebræ. From the latter any backward pressure is rigidly reflected to the origin of the aorta and its environment. Slightly to the left of the middle line the descending thoracic aorta itself is the only structure capable of compression. It is just conceivable that a very large auricle might exert some backward pressure upon the corresponding section of the vessel. Although situated below the arterial supply to the upper limb, any pressure set up at this level would nevertheless exercise a perceptible influence on the shape of the radial pulse.

CONCLUDING REMARKS ON THE PULSE OF AORTIC AND OF MITRAL VALVULAR STENOSIS.

I have endeavored to explain what may be termed the "stenotic" character of the arterial pulse in the mitral affection by calling attention to the lateral pressure which may bear on the arterial blood-current at two and perhaps at three successive stages : in the ventricle ; above the aortic valve ; and at the level of the eighth and ninth dorsal vertebræ. I am not, however, in a position to apportion between these elements of pressure the share which may belong to each in any given case. They are probably variously combined or dissociated. Assuming that some probability attaches to the suggestions which have been made, still it must be obvious that an immeasurably greater distance separates the actual conditions of the aorta, or "the aortic difficulty," in the two valvular affections than that which intervenes between their respective pulse forms. A few remarks are needed in connection with this obvious disproportion.

Clearly, the impediments to which I have alluded cannot be compared with the obstruction set up by a tight calcareous or fibrous stenosis of the aortic valves. They constitute an obstacle which the ventricle can deal with, so long as sufficient time is allowed. Nevertheless, when the lateral pressure is considerable, and when the circulation is otherwise impeded, and the heart suffering from malnutrition, the effort may at times prove more than can be borne, and we are not surprised to find that *angina*, which is said never to occur in mitral regurgitant disease, is not uncommonly observed in mitral stenosis.

Again, if we look to the heart, we do not find in its left ventricle those profound changes which are inseparable from the existence of permanent and rigid obstruction; there is neither any dilatation of its cavity nor any hypertrophy of its wall. We must conclude that there never has been any failure to empty the ventricle, never any accumulation of retarded blood within it, and that the ventricular fibre has never been working against an immovable load, with a resulting elongation, instead of the normal shortening, of its muscular elements during activity.

We may thus take it that, as regards the ventricle, the pulse-tracing and the pulse itself do not express the whole case. Their similarity in the two diseases disguises an essential difference. The gravity of the ventricular difficulty is inadequately represented in the aortic stenosis tracing, as compared with the ventricular conditions in mitral stenosis; or, to put it otherwise, the importance of the ventricular difficulty is, as it were, overstated in the mitral sphygmogram, as compared with the degree of ventricular distress arising from aortic stenosis.

The fact is that the pulse reports as to the aortic constriction, or as to the impeded systolic expansion of the aorta, rather than as to the quantity of the ventricular contents to be forwarded through it. It is a measure of the power of the ventricle (or systolic blood-pressure) rather than of the size of its load, which may be large, moderate, or small,—large in aortic valvular stenosis, small in mitral stenosis.

As to the degree of the stenosis, the pulse could supply us with reliable information so long only as all other factors were identical; but they vary in each case. It is true that the duration of the pulse-wave, coupled with its size, enables us to form a very rough estimate of the degree of interference with the circulation. We must not, however, forget that a very slow and lengthy pulse-wave may mean a very narrow stricture; but that it may also mean a very large outflow through a moderate constriction.

The practical conclusion is that, although the similarity in the pulse tells us of a similarity in the mechanism of the ventricular systole, it keeps us imperfectly informed as to the degree of the mischief; and that the pulse-wave affords us no safe clue as to the nature of the obstruction, nor as to its seat, whether ventricular, valvular, or aortic.

In mitral stenosis the ventricle is practically equal to its work; the obstruction is never such that it cannot be forced. We may even venture

to say that this ventricular efficiency is probably retained almost to the last, for we can trace after death no evidence of its having been lost. That which fails is the material for work,—i.e., the blood. With increasing mitral stenosis the ventricular supply is gradually lessened, the ventricle contracts on less and less blood. We should remember that this is due not only to the narrowing of the inlet, but also to the shortening of the diastolic time; and that this again is brought about by the dilatation and exhaustion of the right heart. The overloaded right ventricle falls into the hurry of weakness, and its systole loses power in proportion to its hurry.

The effect of this hurry on the left side of the heart is disastrous; the time of transit through the mitral constriction is diminished coincidently with a fall in the driving pressure. Thus the left heart ceases not only to be properly filled, but also to be properly fed through the coronary arteries. It is at this stage, the stage of loss of compensation, that all resemblance ceases between the aortic and the mitral stenosis pulses. The pulse in the latter disease is starved and quickened; whereas, with the former, aggravation of the stenosis slows the pulse without diminishing its volume to the extent that might have been expected, until the final stages of left ventricular dilatation and exhaustion deprive it of its distinctive characters.

Therapeutic indications of great importance are based upon a knowledge of the significance of the two opposite varieties of the pulse in mitral stenosis; but to dwell upon them is not part of the object of this paper, which is merely an endeavor to throw light on the mechanism and on the march of the disease, through a study of the variations in the tension and in the other peculiarities of the pulse.

A CASE EACH OF BILATERAL ADULT ATHETOSIS, LETH- ARGY, AND ADULT ACUTE CHOREA WITH DEATH.

BY R. M. PHELPS, A.M., M.D.,

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Bilateral Athetosis.—Athetosis is defined as a “cerebral affection characterized by slow, deliberate motions of the fingers and toes, and by inability to retain them in any position in which they may be placed.”¹ Gowers and others give this affection a scanty recognition, seeming to think it to be manifested chiefly in cases of so-called “hemi-chorea,” and as a symptom-group of varying origin. While this is undoubtedly true in a logical sense, it might also be true of chorea, for they seemingly both deserve the same footing, although athetosis is the more rare.

¹ Rosse, Reference Hand-Book of the Medical Sciences.



Dr. R. M. Phelps's case of adult bilateral athetosis.

As the histories of cases have multiplied, however, classes have come to be outlined. The post-hemiplegic state is, perhaps, the most common. The congenital or imbecile,—the sequel of gross brain lesions,—the idiopathic, the syphilitic, etc., have been named. The most rare form, however, has seemed to be the adult idiopathic case of a bilateral character.

As I have noted no mention of a case of this sort in Minnesota, I venture to present the following history as somewhat rare.

CASE.—A woman, aged twenty-five years, was admitted to the State Hospital July 18, 1894. She came here from the City and County Hospital of St. Paul, and had been there only ten days, when she was described by physicians there as manifesting the same symptoms as noted here.

On admission her drawn face and queer grimaces suggested an hysterical form. The next day, however, they were seen to be permanent, and a study of symptoms was begun leading towards a diagnosis of general athetosis.

Her symptoms are about as follows: On any attempt at motion her hand flexes at the wrist, the fingers flex on the hand, and the so-called "base-ball" hand is presented. The legs and feet undergo similar motions. These positions do not come suddenly, but the members slowly writhe into and out of them in an irregular way. If sitting in a chair (her usual position when up) her legs will stick out without support, her feet will pronate on the ankles, and the toes on the feet. Her facial muscles will slowly elongate, then broaden and frown, all muscles slowly changing from one state to another. The chest muscles and the muscles of the trunk, as a whole, become tense. In fact, about all her muscles undergo extreme and exhausting tension. She will often show distress at this tension, and will with difficulty utter an inarticulate cry. Occasionally she has been able, after a minute or two of trial, to utter one word, but I have never known her to succeed in saying more. She has been able to take a few steps along the ward, but has fallen and bruised her face several times in the attempt. She has failed some since coming here. Nurses are fearful of her choking, for she does not control even her breath, and at emotional excitement (as when the doctor comes into the room) she will catch and choke. She has to be fed like a child, and with "spoon-food" chiefly.

The slight preceding history attainable states that she had a difficult labor about four years ago, and that since that time, and especially during the past two years, she has been failing. A sister is said to have beginning trouble of the same kind.

Of her reflexes, the knee-jerk seems somewhat exaggerated, though tension interferes somewhat with the test. Ankle-jerk the same. Superficial reflexes uncertain, probably normal. Sensibility is probably not impaired, although the sluggishness of response seems peculiar. But it is judged to be only a marked indication of the lack of control over muscles and the tension they are in. Her brain, probably, receives the knowledge quite promptly. The electrical reactions seem about normal, though muscular response is sluggish against the tension.

The mental state is one of simple, symmetrical weakness of mind. It is, indeed, hard to judge of, for she is shut out from us almost like a paralyzed and dumb person. She has a good knowledge of her state and her wants, however. Physically there has been considerable emaciation, the tendency of the muscular tension and exertion being, as in chorea, towards exhaustion. By keeping her in bed for the past two weeks we have made her gain some, for, as is not mentioned above, the muscles gradually come to a state of rest in complete quiet and in sleep.

I make only a few comments. This case will be seen to tend towards the choreic type. The only quick motion noticed is the occasional, peculiar,

quick unlocking of the jaw. The general distribution of the trouble suggests the relationship. So also the relaxation in rest. Nevertheless, the motions are all slow and writhing, are contractures, are deliberate, and there is inability to retain the limbs in any desired position. The relationship to chorea would be seemingly as clear as between the cases of hemichorea and hemi-athetosis. The cause would be seemingly cerebral, but there are noted no localizing symptoms any more than in chorea. A photograph herewith shows the appearance of the patient on request to raise the hand to the face.

A Case of Lethargy.—Lethargy has been defined as “a condition of profound semi-unconsciousness partaking of the nature of sleep.” The most noteworthy recent case reported is that by Dr. Clarke, of the Kingston Asylum, Ontario. His case had a history of one period of sleep of seven years’ duration and another of eleven, lasting till near death. Both of the parents of this patient were insane.

In this hospital we have had, besides some minor cases, two quite well-marked examples, one of which is the subject of this sketch. The first patient, an intelligent young woman, slept in this way for about one week. She was somewhat silly after coming out of the spell, but gradually steadied to a good recovery. She later described to us all the efforts that we had made to awaken her (by electricity, pins, etc.), showing a clear memory of all that had happened, and described herself as under the influence of delusions, by reason of which she resisted all tendency towards motion.

The second case is that of a young man, aged twenty, whose mother was epileptic; mental perversion had been noted for about one year. He was admitted here October 20, 1893, with a history of having spent the several preceding months partly in a hospital, and lastly in a poor-house. He was said to have slept in spite of all efforts, and to have taken so little food that it was supposed that he would die. On coming here he was very much emaciated, but enough awake to be able to sit up in a chair without collapsing. After a little time slight activities began, and in three months he was about the ward and very lively, and fairly clear in mind. By March, 1894, he had passed to the other extreme, a mildly mischievous, maniacal state. He went home for a time, but became too troublesome to stay, and was brought back May 11, 1894. He was then somewhat more dull, though irritable and quarrelsome. July 10 he complained of being sick and stayed in bed. July 12 he was still in bed, lay very quietly, but would arouse to say a few words. July 15 he was more quiet, and took little nourishment. July 20 he moved slightly at times; took only milk; rarely made any voluntary movement. July 25, careful feeding had been needed since last note, and patient effort secures to him about one quart of milk two or three times a day, which goes down mechanically. August 15, patient the same. Nurses change him from side to side to avoid bedsores. He has gained in flesh from the above feeding. October 1, patient has continued steadily the same, and for days there will be no evidence of change of position. Occasionally, however, he will be found to have somewhat changed position in the night. Of late there has been somewhat of a moaning sound at times also. He remains the same to date (October 20). Massage and hot baths have been tried, and he seemed at times to be preparing to awake. When giving the bath, on pushing him down as if his head were going under he made movement

backward. He will probably complete the cycle of behavior by coming out before long.

Physical examination reveals normal reflexes, and no special defects. Pulse from 68 to 100; respiration and temperature normal. Faradism demonstrates each special muscle touched without moving the rest. Pin-pricking is of no avail. Slapping of the face produces some flushing, and a slight hint at a frowning of the muscles of the forehead. The eyelids, however, are always the tell-tale muscles. They resist strongly any uncovering, and are frequently in a quivering, unstable state, which is increased under irritation. I have no doubt that he knows everything that is said about him.

His state we consider neither a sleep nor a coma, but a voluntarily assumed condition, probably under the influence of strong delusions. This is quite similar to the stuporous melancholia, of which I should think it to be a variety.

Acute Chorea, with Death.—Acute adult chorea with mental impairment and death seems sufficiently far from the ordinary run of cases to deserve a description. Of the chronic and, at times, hereditary form, with progressive failure to death, we have had seven cases. Of a mild form in youth with recovery we have had several cases. But of an adult extreme form leading to death we have had only this one. In this case, perhaps, more than in others the chorea might be considered as symptomatic of some more gross brain or nerve impairment.

CASE.—A woman, aged thirty, was admitted March 27, 1894. She was of good habits, a housewife, with weight of one hundred and eighty pounds, well nourished, and with heart and lungs in fair condition. No history of chorea accompanied her, yet it was fairly perceptible in her nervous movements. She had a half-bewildered expression, and a half-bewildered mental state, hard to describe accurately in a few words. She could answer questions quite intelligently. Her history stated her to be melancholy and to think "her friends to be enemies," but no delusions were noted while here.

The chorea increased some for a day or two after admission, then receded, and at the end of the first week she seemed quite well physically and quite clear mentally, and a complete recovery was expected. April 8 she began to be again choreic and restless. April 12, choreic movements have increased and she is never still except when asleep. She destroys clothing in her movements, and her mind seems to work in a choreic way also. Holding her seems to excite resistance, and complete freedom seems unsafe, so a cloth restraint-sheet with suit to hold her in bed has been ordered. April 13 she is reported as sleeping three and one-half hours in the twenty-four. It is difficult for her to get any nourishment. She has bitten her tongue. She has opisthotonic movements, with writhing and foaming at the mouth. The projecting portions, such as knees, heels, hips, arms, and shoulders, are becoming excoriated. The mouth is dry and sordes must be frequently removed. The whole is a distressing picture never to be forgotten. Her temperature went up to 100.2° in the forenoon, 102° in the afternoon. Her mouth was washed out every few minutes. Some milk and eggnog were taken down by gulps by watching for favorable opportunities.

April 14 she took some milk toast and tea in the forenoon. A hot bath with cold to the head was tried and quieted her, and she ate a fair dinner at 4.30 P.M. April 15, temperature 4 A.M., 99.2° F. A dose of chloral and a hot bath were prescribed in the

morning. At 1 P.M. the temperature was 100°. She took several glasses of milk during the day; was quieter but growing weak. April 16, morning temperature 99.4°, pulse 134, respiration 26. She was seen to be failing, and was taken out of the restraint, as she was more quiet. At 9 A.M. took glass of milk, at 10 A.M. a glass of egg-nog and slept some, at 12, noon, took one-half glass milk. She failed steadily in strength, however, became unconscious at 2, and died at 3.30 P.M.

No autopsy was obtained. The patient died, as far as could be judged, from the exhaustion of the activity. She grew mentally more clear towards the last, and the day before predicted her own death. The treatment, beside other things, included a trial of the effect of some hypodermics of strychnine. The only important effect was from the hot bath. It was subsequently learned that she had had some chorea at the time of her last pregnancy, about one year before; that it had passed away, but that she had never been "exactly right" since that time.

MEDICAL EDUCATION IN AUSTRALIA.

BY J. STEELE ROBERTSON,

Secretary of the Medical School, University of Melbourne.

THE two reports on "Medical Education in the United States and Canada," issued by the Illinois State Board of Health, I have read with great interest. They reveal a remarkable diversity in medical teaching in North America, but also prove that a continuous and more or less organized effort is being made to raise the standard of medical education to that of the best European schools.

Apparently a great deal of what opposition there is to this upward movement is based upon a notion that the United States is still too new a country to warrant the standard of medical education there being brought into line with that of Europe. Comparisons may be odious, but, nevertheless, they are often both interesting and useful. An account, therefore, of medical education in Australia, a much newer country than the United States (the very first settlement in Australia took place only one hundred and seven years ago,—i.e., several years after the American War of Independence came to a close), may be of interest to American teachers and students, and may even be a useful weapon in combating the conservative opposition above mentioned.

Australasia has five universities,—the University of Sydney, in New South Wales; the University of Melbourne, in Victoria; the University of Adelaide, in South Australia; the University of New Zealand, and the University of Tasmania. Attached to the first four are medical schools. These are the only medical schools in Australia, the various colonial governments having wisely recognized the propriety of requiring a university standard in local medical education. Of the four schools, that in Melbourne is by far the oldest, having been founded in 1862; that in Sydney was not

organized till twenty years later; while those of Adelaide and New Zealand are of even more recent birth.

All four universities require, and always have required, a five years' course for their lowest medical degree, which is the combined degree of Bachelor of Medicine and Bachelor of Surgery, and all four demand a preliminary examination in general education. Two other medical degrees are granted,—viz., Doctor of Medicine and Master of Surgery, for each of which further study and further examinations are required. As all the schools have practically the same regulations, they recognize each other's teaching by admitting each other's graduates and undergraduates *ad eundem gradum* and *ad eundem statum*. This being the case, a description of the course at the medical school of the University of Melbourne will stand good for all.

The intending medical student must be of the full age of sixteen years, and must have passed the preliminary examination, which is the university matriculation examination, in the following six subjects,—to wit, Arithmetic, pure and commercial; Algebra, as far as quadratic equations; Geometry, being the first three books of Euclid; English, Latin, and either Greek, French, or German. In English, in addition to grammar and composition, a minute knowledge of a set amount of literature—one thousand lines of poetry, not earlier than Milton (of which two hundred and fifty must be learned by heart), and prose equal to ten essays of *The Spectator*—is required. In Latin, the set books are one book of Virgil's *Æneid* and one of Cæsar's Commentaries, or their equivalent; and in Greek, one book of Xenophon's *Anabasis*, or its equivalent. In French and German there are no set books.

The above details are those for the pass standard only; but there is likewise an honor examination at least twice as difficult for candidates desirous of special distinction, at which an intending medical student has the opportunity of competing for six prizes of ten dollars¹ each, four of one hundred dollars each, and two of one hundred and twenty-five dollars each.

The above is the minimum preliminary test of general education, but an increasing number of students now take a bachelor's degree in arts or science (each a three years' course of at least four subjects per year) before beginning medical study.

The medical course proper covers a period of five calendar years, each of which contains four terms separated from one another by vacations of a fortnight each. Didactic lectures one hour long are delivered during the first three terms, the actual period covered by which is twenty-six weeks and two days. In all subjects except physiology didactic lectures are delivered thrice a week, and in physiology they are

¹ Throughout this paper money values are, for the convenience of American readers, stated in dollars, on the practically correct basis of five dollars to the English pound sterling.—J. S. R.

given daily. In every subject a student, to "keep his course," must attend three-fourths of the lectures. Only those students who have kept their courses and hold the proper certificates of practical work are permitted to present themselves for examination.

While on the subject of lectures, it may be noted that all the didactic lectures are delivered in the afternoon. Second-year men have no lectures before 2 P.M.; third-year men begin at noon; fourth-year at 3 P.M.; fifth-year not till four. The purpose of this is to allow the early part of the day to be devoted to hospital work, of which, as will be seen later, a very great deal is wisely required.

Two examinations are held annually, one in October, the other in December, at either of which the student may present himself. All prizes, by the way, are awarded at the October examination. The examinations are both written and oral, and, where the nature of the subject requires it, practical also. By passing in all the subjects of his year at one time at either examination, or by passing in all but one in October, and in that one in December, the student completes that year, and is then permitted to go on to the next.

Let us now follow a student through his course year by year.

In the *first* year the student attends lectures in (1) Natural Philosophy, (2) Biology, and (3) Chemistry, and in the last two subjects does five hours a week of practical work. A prize of one hundred dollars is awarded to the best man in each subject.

In the *second* year the student attends lectures on (1) Junior Descriptive and Surgical Anatomy, (2) Materia Medica and Elementary Therapeutics, and (3) Physiological Chemistry and Histology, with practical work in the last for six hours a week during the first and second terms. He also dissects a complete cadaver to the extent treated of in the Junior Anatomy lectures, and attends six months' instruction in practical pharmacy at the Melbourne School of Pharmacy. His mornings he spends during nine months in attending the out-patient surgical department of the Melbourne Hospital, and there receiving instruction in minor surgery and the application of surgical apparatus. The examinations cover the subjects of the didactic lectures. One prize of one hundred dollars is awarded for anatomy, and another of the same value for the other two subjects combined.

In the *third* year he attends lectures on (1) Senior Descriptive and Surgical Anatomy, (2) Surgery, and (3) Physiology, with practical work in the last for four hours a week during the third term. He also dissects a complete cadaver minutely. His mornings he spends during nine months attending the in-patient and out-patient medical practice of the Melbourne Hospital, and learning how to examine medical patients. He also attends post-mortem demonstrations during six months. The examinations are in anatomy and physiology, a prize of one hundred dollars being given in each subject.

During the *fourth* and *fifth* years the student does a very large amount of practical work. In the *laboratories* he takes a course of Pathological

Histology twice a week during the second term, and a five weeks' course of Elementary Practical Bacteriology. In the *dissecting-room* he dissects a complete cadaver minutely, with special reference to regional and applied anatomy, and attends demonstrations of operative surgery on the cadaver. In the Melbourne Hospital he attends during nine months of one year the in-patient surgical practice with clinical instruction and lectures on Clinical Surgery, and during six months of that time acts as a surgical dresser; during nine months of another year he attends the in-patient medical practice with clinical instruction and lectures on Clinical Medicine, and during six months of that time acts as a medical ward clerk; he also attends another six months of post-mortem demonstrations. He must further acquire proficiency in vaccination under the direction of a government public vaccinator, and must attend either three months' midwifery practice at the Women's Hospital, or twenty midwifery cases under a registered medical practitioner. All this practical work he does during his fourth and fifth years in whatever order is most convenient for himself and the institutions concerned.

During the *fourth* year he attends lectures in (1) Theory and Practice of Medicine, (2) Pathology, (3) Therapeutics, Dietetics, and Hygiene, (4) Obstetric Medicine and Diseases of Women and Children. The examinations cover regional and applied anatomy, pathology, therapeutics, dietetics, and hygiene; the prizes being one hundred dollars for anatomy and pathology combined, and one hundred dollars for therapeutics, dietetics, and hygiene.

In the *fifth* year the student attends a second course of lectures in Medicine, a second course in Surgery, and a course in Forensic Medicine and Psychological Medicine. There are theoretical and practical examinations in medicine and surgery, and theoretical in obstetric medicine and diseases of women and children, and in forensic medicine and psychological medicine. The honor examinations for the fifth year are held in the following February. At these there is a prize of three hundred and seventy-five dollars for medicine and forensic medicine combined, another of three hundred and seventy-five dollars for surgery and obstetric medicine and diseases of women and children combined; also, under a special endowment, a prize of two hundred and fifty dollars for surgery, and another of two hundred and fifty dollars for pathology, pathological histology, and bacteriology.

As showing how completely practical the Australian medical courses are, let it be noted that during the last four years of his course a student, besides listening to didactic lectures, must do at least eighteen months' surgical practice, eighteen months' medical practice, and three months' midwifery practice in a recognized hospital, do six months' practical pharmacy, attend post-mortem demonstrations twelve months, and dissect three complete cadavers.

On completion of this five years' course the double degree of Bachelor

of Medicine and Bachelor of Surgery is conferred on the successful student, and the newly-fledged graduate goes and buys a stove-pipe hat and has himself registered as a medical practitioner by the Medical Board of Victoria, or in whatever other portion of the British Empire he intends to practise. The total fees for the course and the two degrees come to not quite six hundred and fifty dollars.

As none of the Australian medical schools have hospitals of their own, they make special arrangements with the largest hospitals of the cities in which they are situated for the admission and clinical instruction of their students. In Melbourne all the male students attend the Melbourne Hospital, which is fifteen minutes' walk from the university and about five minutes' walk from the three central railway stations. The Melbourne Hospital annually treats about four thousand five hundred in-patients and eighteen thousand out-patients, so that clinical material is very plentiful indeed. The women students attend the Alfred Hospital. The obstetrical practice is obtained at the Women's Hospital, across the road from the university. Special instruction is also given at the Eye and Ear Hospital and the Children's Hospital.

Between the Melbourne Hospital and the university there is a special financial arrangement by which the university pays a lump sum to the hospital staff in return for clinical and other instruction. The other hospitals receive only certain fees from students attending them. The Melbourne Hospital honorary staff consists of nine physicians, nine surgeons, two pathologists, and one dentist, while the salaried staff comprises a resident medical superintendent, five resident medical officers, and three dispensers. With so large a staff every opportunity is manifestly afforded the student for practical work.

The regular university teachers attached to the medical school, as distinguished from the hospital clinical teachers, are divided into two sections. The one consists of gentlemen who devote their whole time to teaching and are debarred from private practice, while the other comprises leading medical men in private practice who devote only a specified portion of their time to teaching. All teachers—the Australian medical schools here differ markedly from the American—receive fixed salaries, and are totally independent of students' fees, these going into the general university chest.

The full-time staff consists of five professors and four gentlemen holding the compound title of demonstrator and assistant lecturer. A better title would be assistant professor. The professor of Physiology and the professor and assistant professor of Anatomy and Pathology devote their whole time to the medical school, while the professors of Chemistry, Biology, and Natural Philosophy, with their assistant professors, teach also in the arts and science schools. Each professor is appointed to a life tenure at a salary of three thousand seven hundred and fifty dollars, with three quinquennial increments of seven hundred and fifty dollars each. He also

receives either a house in the university grounds or a house allowance of five hundred dollars per annum. The assistant professors receive a salary of two thousand dollars per annum, without increments.

The part-time staff comprises six lecturers and six demonstrators. The lecturers have each an annual salary of one thousand dollars, their subjects being (1) *Materia Medica* and *Elementary Therapeutics*, (2) *Surgery*, (3) *Medicine*, (4) *Obstetric Medicine* and *Diseases of Women and Children*, (5) *Forensic Medicine* and *Psychological Medicine*, (6) *Therapeutics*, *Dietetics* and *Hygiene*. The demonstrator of *Physiology* receives twelve hundred and fifty dollars per annum, while of the five demonstrators of *Anatomy* two receive five hundred dollars per annum, and three are honorary.

The teaching accommodation consists of four lecture-theatres, large enough to hold from one hundred and fifty to two hundred students, and one smaller theatre with seating capacity for one hundred. There are spacious and well-equipped laboratories for biology, chemistry, physiology, and pathology, with the usual complement of skilled assistants, a large and well-lighted dissecting-room, and a medical library containing nearly five thousand volumes. In addition, each professor has a private room of his own, and there are two robing-rooms for lecturers, and two students' rooms for men and women respectively.

Since the foundation of the medical school, in 1862, the following degrees have been conferred: Bachelor of Medicine, three hundred and thirty-seven; Bachelor of Surgery, two hundred and sixty-two; Doctor of Medicine, one hundred and thirty-three; Master of Surgery, six. As, however, most graduates hold more than one degree, the total number of individuals having Melbourne degrees, including men admitted *ad eundem*, is probably about four hundred.

The number of students attending lectures during 1894 is two hundred and nineteen, divided as follows: First year, fifty-six; second year, forty-five; third year, twenty-nine; fourth year, thirty-three; fifth year, twenty. The average rate of "plucking" is forty-five to fifty per cent., from which the difficult nature of the examinations can be fairly gauged.

Should a Bachelor of Medicine or a Bachelor of Surgery desire to obtain either of the higher degrees, Doctor or Master, he has much more travail to undergo.

Candidates for the degree of Doctor of Medicine must be Bachelors of Medicine of at least two years' standing, and since taking the lower degree must (1) have attended during two years the medical practice of a recognized hospital, or (2) have attended during one year the medical practice of a recognized hospital and been three years in the public practice of their profession, or (3) have been five years in the public practice of their profession. Certain concessions in time are allowed: men who have taken first- or second-class honors in their final year. Also, they must have attended during three months the practice of a hospital for the insane. The subjects of examination are logic, medical psychology, and medicine.

Candidates for the degree of Master of Surgery must be Bachelors of Surgery of at least two years' standing, and since taking the lower degree must have fulfilled conditions as to surgical practice similar to those set out above for medical practice. The subjects of examination are logic, surgery, surgical anatomy, operative surgery, surgical pathology, and the use of surgical apparatus.

It may be thought by American readers that the medical course in Australia is unnecessarily long and needlessly varied. The answer is that human life is too sacred a thing to be placed at the mercy of half-trained men. It is they who bring disrepute upon the noble profession of medicine, and expose it to scurrilous gibes about "kill or cure" and "licensed to kill." One thoroughly-trained practitioner can do more good in the world than a thousand half-trained men, and he certainly does infinitely less harm.

A NEW METHOD OF CLOSING A LARYNGEAL FISTULA.

BY CLAYTON PARKHILL, M.D.,

of Denver, Colorado,

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MR. N. O., aged twenty-four years, a man of powerful physique, was sent to St. Luke's hospital on November 15, 1893, having been referred to me through the kindness of Dr. W. W. Reed, of Fowler, Colorado. He gave a history of having attempted suicide by cutting his throat on October 27 of that year. He had made use of a razor for this purpose, and throwing his head back, had cut his throat almost from ear to ear. One or both of the external jugular veins had been severed, and the deeper vessels barely missed. The larynx was completely cut through on a plane with the ventricular bands, and immediately over them. His life was almost sacrificed to hemorrhage before Dr. Reed reached him. After taking appropriate measures to check the bleeding, the doctor sutured the wound. The patient subsequently made another attempt to end his life by drawing out the stiches, and by so doing infected the wound. The result was a profuse suppuration, and Dr. Reed, in order the better to defend the larynx from this pus, excised the upper portion of the thyroid cartilage, which had been severed in the original injury. Soon after this the patient came under my care.

On examination I found an infected wound extending from sterno-mastoid to sterno-mastoid, and the upper part of the larynx was completely exposed. Under careful dressing the lateral wounds healed rapidly, but nature made no attempt to close the laryngeal opening. Unfortunately, I did not have him photographed at this time, but Fig. 1 gives a crude idea of the appearance of the larynx. The central space shown in this drawing



FIG. 1.

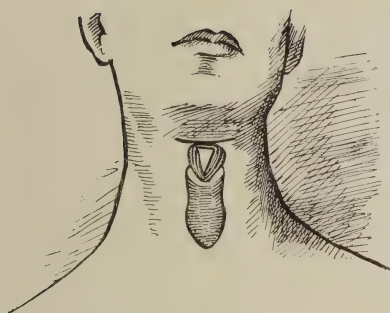


FIG. 2.

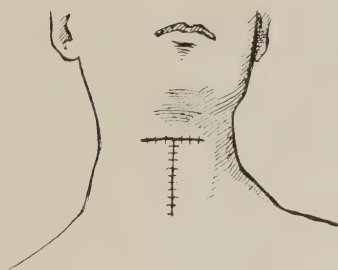


FIG. 3.

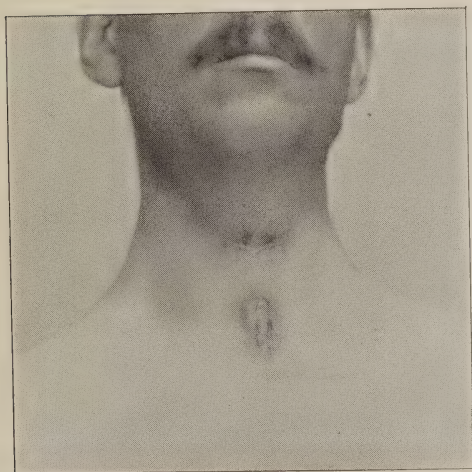


FIG. 4.—Appearance of wound after healing had taken place.

represents the opening between the ventricular bands when they were quiescent. It was observed, however, that in the attempt at phonation these bands came together in the same way as the vocal cords.

On February 14, 1894, I operated upon him for the closure of this laryngeal fistula. It was apparent to me that any operation which would close the opening must provide a mucous membrane for the anterior laryngeal wall. I was not familiar with any method which had been proposed for the closure of this fistula which contemplated this, so I devised the following operation. Fig. 2 shows the lines of incision. The first step consisted in completely denuding the margin of the fistula. A gauze sponge packed into the opening prevented the blood from entering the larynx until hæmostasis was effected. I then made an incision which outlined a tongue-shaped flap, as shown in Fig. 2, which extended downward to the suprasternal notch. This flap had a width slightly greater than the denuded fistula. I then dissected the flap upward, beginning at its tip below, until I reached a point within a half-inch of the lower margin of the opening. This made a base for my flap for the purpose of blood-supply. It was then turned upward upon itself and stitched in position with catgut sutures to cover over the fistula.

It will be observed that the skin surface was turned inward, and I expected that it would be transformed into a mucous membrane which would line this adventitious anterior laryngeal wall. I then dissected up the tissues on either side of the larynx and of the wound left by the removal of the flap, also the tissue above the larynx, and by gliding them toward each other sutured them in place, completely covering the inverted flap which closed the larynx. The appearance at the end of the operation would be represented in Fig. 3.

I found it practically impossible during the operation to keep the patient under the influence of the anæsthetic, owing to the admission of air through the fistula. In fact, I think he was hardly ever profoundly narcotized. As I remarked to those present at the time, an operation on board a ship in a storm would have been about as easy of accomplishment.

The patient made an uneventful and perfect recovery. The superficial silk-worm-gut sutures were removed on the eighth day. Unfortunately, firm union had not been secured at the lower end of the incision, so there was a little gaping at that point. This, however, was closed promptly. The scar remaining from this will be seen in Fig. 4, below the cicatrix which marks the position of the fistula. This cut was made from a photograph which was obtained some two months after the operation. The man is to-day perfectly well. His voice is good, but low pitched. He tells me, however, and this statement is corroborated by his sister, that it has always been so, and that it is but little changed from what it was before the injury.

So far as I know, this method has never been adopted before in closing a laryngeal fistula. Its perfect and, I might add, almost unlooked-for success in this case warrants me in presenting it to the profession.

STERILITY IN THE FEMALE.

BY ROBERT BELL, M.D., F.F.P.S.G., etc.,

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FOR some years past the subject of sterility in the female has almost daily been forced upon my attention, and as I consider this in the majority of cases to be a curable affection, I make this my excuse for laying the following observations before my professional brethren. I may at once proceed to observe that I consider the one great factor of sterility to consist in a diseased condition of the endometrium. This may be due to various causes, among which may be enumerated stenosis, catarrh, hydrostatic congestion due to a defective heart action, or some other vascular derangement induced by obstinate constipation on the one hand, or a flexion of the organ on the other; certainly it is always aggravated by one or both of the latter when these exist. Stenosis, as well as retroflexion and antelexion and prolapsus, is credited with many evil consequences, among which may be noted dysmenorrhœa, menorrhagia, dyspareunia, irritability of the bladder, painful defecation, muco-purulent catarrh, and almost invariably a depressed and irritable condition of the nervous system. These various pathological conditions would not, however, coexist were the endometrium in a healthy condition; to my mind, we are not sufficiently alive to the fact that not only is endometritis proceeding to metritis a most pregnant cause of the various affections among which I include displacements of the uterus, but by virtue of the continuity of tissue it gives rise to disease of the tubes and ovaries also. Take stenosis of the cervical canal, for example; in nine cases out of ten it is due to a hypertrophic condition of the mucous membrane consequent upon chronic hyperæmia, and we will find in such circumstances, if the condition has existed for any length of time, that the canal of the uterus is in the very opposite condition,—in fact, that beyond the contraction at the os a bagginess of the organ obtains. Such being the case, it is needless for me to remark that forcible dilatation without any other treatment can hardly prove other than injurious. If, however, stenosis is really the primary affection, it does not necessarily imply sterility or even dysmenorrhœa if the upper reaches of the endometrium are healthy, and for this reason, that the spermatozoa can make their way through as narrow a canal as a fluid can escape by, and blood if not coagulated can find its way through a channel of very minute calibre as rapidly as it is thrown off in the process of menstruation. This statement can readily be proved by noting instances where dysmenorrhœa gradually comes on years after puberty has been established, and where it is beyond doubt that

the calibre of the os has not altered in the least degree. The cause of dysmenorrhœa in these circumstances is due to an unhealthy condition arising within the uterus, and it is well known that if blood comes in contact with tissue, be it ever so slightly inflamed, this acts to a certain extent upon the blood and alters its character. Its fluidity is thereby decreased, and hence the distress which so frequently accompanies stenosis, because coagula have to be forced through the contracted channel by uterine action, so that at each period the irritation increases till well-marked endometritis is the result. When this condition is brought into existence it does not confine itself to the uterine canal, but spreads by continuity of tissue into the Fallopian tubes, so that salpingitis is liable to coexist. Now, just as endometritis reduces the calibre of the cervical canal, so does that of the Fallopian tubes become lessened. Especially does this occur at their outlet into the uterus, where the lining membrane of that organ, in consequence of its hypertrophied condition, tends to occlude the orifice. In this way hydro- and pyo-salpinx frequently originate.

These questions, however, are not altogether within the scope of this paper, yet they have a certain bearing upon it, hence I have deemed it right to touch upon them.

I have frequently demonstrated that displacements of the uterus are invariably dependent upon a flaccid condition of its walls, and not so much, as is generally believed, upon a lack of support on the part of the uterine ligaments. It will therefore be unnecessary to notice them at this juncture in connection with the subject under discussion, though they are frequently referred to as causes of sterility. This is an hypothesis, however, I do not feel inclined to support. To my mind the one great factor of sterility is endometritis, and in this I include endocervicitis.

Not so very long ago it was accepted as an axiom that if a woman had ever been the subject of inflammation of the womb she would never become pregnant. Now, however, it is beyond question that this is false doctrine; nay, more, I have met with frequent instances of women who have been the victims of gonorrhœal endometritis bearing children after that was removed; and with regard to simple endometritis, I could detail numberless instances of pregnancy occurring after its removal.

Endocervicitis may certainly *per se* be the cause of sterility, and doubtless occasionally is; but it is so rarely disassociated with a similar condition of the endometrium, and endometritis is never present without endocervicitis being coexistent, that it is quite unnecessary to consider them individually in relation to this subject.

How, then, it may be asked, does endometritis act as a factor in producing sterility? and why do physicians hold that the chances of a woman becoming a mother are lessened as years advance if pregnancy does not take place during the earlier period of married life? If we examine the discharge which is secreted so abundantly in endometritis, we shall find that it frequently consists of a muco-purulent fluid of an acrid nature. The

character of this fluid is so irritating that in its passage over the vaginal portion of the cervix it denudes it of its mucous surface, giving rise to erosion and papillary ulceration, and not unfrequently to vaginitis as well. The effects of its acidity being so injurious to the mucous surfaces over which it passes, can it be doubted that it will have a destructive effect upon the spermatozoa when they come in contact with it? Though this were not actually the case, however, the disorganization of the endometrium produced by it would certainly deprive that membrane of the power of affording a proper nidus for the ovum, even if the latter were to become impregnated.

If pregnancy does not follow marriage within a reasonable time, there must in the majority of cases be present some faulty condition of the generative organs of the female; this, at all events, is the only deduction I can draw from the dictum already quoted, that the chances of a woman becoming a mother grow less as years advance after marriage.

In the first place let us consider what is the probable cause of sterility in such a case. There certainly may be stenosis, but that, as I have said before, would not prevent impregnation, for the cogent reason that it could not act as a barrier to the spermatozoa gaining entrance to the cavity of the uterus,—that is to say, if the canal is sufficiently patent to permit the menses to escape. If, therefore, there is stenosis, without pain at menstruation, it can safely be inferred that no disease of the endometrium is present, and therefore no mechanical hinderance to conception. Again, flexions are frequently accredited with being factors of sterility. This, however, is only due to the fact that they indicate an unhealthy condition of the uterine lining membrane and walls; in short, they are only accessory conditions to and dependent upon the one prime factor of sterility,—viz., endometritis.

Now, we know that not unfrequently unmarried women are the victims of this disease, and though in many instances it may not be sufficiently severe to interfere very much with the general health before marriage, the case becomes very much altered after that event. As time goes on, the diseased condition does not tend to diminish, but to increase, in consequence of the greater excitement the organ undergoes. The unhealthy condition which at first was trifling becomes in consequence more and more pronounced. It is little wonder, therefore, if sterility is persistent. If, however, the endometrium by judicious treatment is restored to its normal condition, I have no hesitation in affirming that it matters not how long after marriage it is accomplished, the most powerful as well as the most frequent barrier to conception will have been removed. In speaking thus I am not hazarding statements which I cannot bring forward an abundance of statistics to support; therefore I have no hesitation in placing them before the profession for acceptance. Many a miserable woman goes through life under the impression that she is incapable of becoming a mother, while in reality the fault lies in a curable affection of the uterus. Many women have only one child, others two, and so on; these cannot surely be said to

be sterile, yet they are *pro tem.* quite as unable to bear children as the so-called barren woman. In both instances the cause is the same.

One is frequently called upon by women who have not borne children for a variable number of years, and yet their ages do not preclude this. Moreover, they will tell you their health has never been so good as it was wont to be since their last pregnancy, and then you will elicit from them subjective symptoms which will force you to the conclusion that the uterus is in an unhealthy condition. When this is removed, in all probability another epoch of childbearing will be inaugurated. Such at least has been my experience.

As I have before remarked, it will frequently be discovered that when stenosis of the cervical canal exists the cavity of the uterus is dilated and gives the sensation of bagginess when the sound is introduced. In such circumstances the uterine walls will be found to be flabby, and a flexion, probably backwards, will speedily ensue if the tone of the organ be not forthwith restored. It is obvious that in such circumstances the stenosis is not the stumbling-block to impregnation, but, on the other hand, the acrid secretion from the endometrium is both an aggravation of the stenosis and the destructive power which acts upon the spermatozoa.

It must also be noted that endocervicitis may exist for a time without the endometrium being also involved, but sooner or later, either by extension of the inflammation or by the repeated monthly efforts of the uterine walls necessary to propel the menses through the narrow channel, or both combined, the endometrium must of necessity become involved.

The more extensive my experience the firmer becomes my conviction that endometritis is the one great cause of sterility, and not only of sterility, but of flexions and oöphoritis also. This being the case, the treatment of these affections is not difficult to conduct, and leads to a happy termination of the disease. To carry this out successfully, however, it is necessary to insist that during the process the sexual organs should be kept quiescent.

In conclusion, it may not be out of place to state that recovery will be very much accentuated if the treatment be inaugurated by curetting the endometrium before the weekly or bi-weekly applications of iodized phenol to the canal are commenced, which should be supplemented by the introduction of a tampon saturated in the glycerin of alum and boracic acid solution. If this treatment be carried out thoroughly, I have no hesitation in predicting that the time occupied in procuring a satisfactory result will be very materially diminished.

REVIEW OF MEDICINE.

MEDICINE.

IN CHARGE OF JOHN H. MUSSER, M.D.,

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AND

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The "Oyster Epidemic" of Typhoid Fever at Wesleyan University. (*New York Medical Record*, December 15, 1894.) By H. W. Conn, Ph.D., of Middletown, Connecticut.

Between October 20 and November 9, 1894, twenty-six cases of typhoid fever developed among the students in Wesleyan University. Investigation as to the cause of the disease revealed the following facts: The students attacked did not all room in the same college building, nor did they all get their meals at the same boarding-place, but were widely scattered through the college and the town. The wells on the college campus were found to be practically free from contamination. The ladies of the college were exempted from the disease. All cases of sickness, with three exceptions, were found to have occurred among the members of three of the college fraternities. The water, milk, and food at the fraternity club-houses were found to be free from contamination, and the sanitary arrangements of these club-houses were discovered to be in good condition. These three fraternities had held initiation suppers eight days before the development of the first case, and, in examining carefully the bills of fare, it was found that all articles of food could be excluded as possible sources of infection, except raw oysters furnished to each fraternity by the same oyster-dealer. On inquiring into the source of supply of these oysters, it was found that they had been fattened in a fresh-water creek, emptying into Long Island Sound, just below the outlet of a sewer from a house in which were two cases of typhoid fever,—one of these proving fatal. The oysters were evidently the cause of the epidemic, the dates of shipment and outbreak of the disease being close together. On further inquiry it was found that of the three cases of fever occurring in men not members of the fraternities, one of them was a guest at one of the banquets, one had eaten raw oysters in the saloon of the oyster-dealer supplying the bivalves, while the third was not able to be questioned. Of alumni and out-of-town

guests at these suppers it was learned that several were taken ill after returning home, four with unmistakable typhoid symptoms. Further, men in Amherst College who had eaten raw oysters from the same source were taken with typhoid fever.

On Otitis Media complicating Diabetes. (*Berliner klinische Wochenschrift*, December 17, 1894.) By Hugo Davidsohn, M.D.

Davidsohn reports a case of otitis media diabetica, and discusses the three questions that have been raised by the reports and observations of Kirchner, Kuhn, Moos, Schwabach, and Körner as to—

1. What is the etiological relation between the constitutional disease, diabetes, and the local affection of the ear?
2. What part of the ear is primarily affected, the tympanic cavity or the cells of the mastoid? and
3. When should operation be undertaken during the diabetes?

As to the first question: as the patient had had a precisely similar otitis over twenty years before when the diabetes did not exist, Davidsohn thinks that on both occasions it arose from micro-organisms which found their way to the ear through the Eustachian tube. The only etiological influence that the diabetes exerted was the lowering of the vitality of the tissues.

To the second question he answers that, in this case at least, though it is contrary to the opinions of most authorities on the subject, the clinical course of the disease shows that it was primary in the tympanic cavity and only secondarily a mastoiditis.

The ideal time for operating is when under constitutional treatment the diabetes has begun to recede, for then we get prompt and satisfactory healing, but practically Schwabach's axiom is best: "even in diabetes the indications for opening the mastoid are the same as when diabetes does not exist as a complication."

In mastoid disease the urine should always be examined for sugar, and in those cases where there is a suspicion of diabetes, though no sugar be found, further tests should be made after the operation is completed.

On the Value of repeatedly washing out the Stomach at Short Intervals in Cases of Opium or Morphine Poisoning. (*Johns Hopkins Hospital Bulletin*, October, 1894.) By L. P. Hamburger.

That morphine is eliminated by the gastric mucous membrane after it has been absorbed is shown in a case cited by the writer. Ten grammes of opium were taken by a Chinaman with suicidal intent. About seven hours after taking the drug the stomach was repeatedly washed out, until the physicians in charge had reason to think that there was no longer any opium in the stomach. A second lavage was made two and a half hours later, and the last three and a half hours after the second,—a quarter of an hour before death. The fluid secured in these two last washings was colorless, and from this fact it is concluded that all the crude opium had been

removed by the first washing, positive proof being wanting, however, as the last portion of the first washing was not kept separate from the rest and chemically examined. Notwithstanding the fact that the color and odor of opium were wanting in the last two washings, chemical tests showed very clearly the presence of the alkaloids, but did not respond to the tests for meconic acid. Morphine was also found in the urine.

Alt has ascertained that for dogs doses of more than ten to twelve centigrammes morphine pro kilo hypodermically administered may be considered lethal; seventeen centigrammes pro kilo almost invariably caused death. On the other hand, if, immediately after the injection, the stomach was washed and the lavage continued for forty-five minutes, then ten to twelve centigrammes pro kilo never produced serious symptoms, and indeed with seventeen centigrammes and even twenty centigrammes pro kilo the symptoms of poisoning were not so severe as when twelve centigrammes were administered without repeated washing. Two dogs were saved after the injection of so large a quantity as twenty-four centigrammes pro kilo.

In connection with this subject Hamburger repeats Kobert's suggestion, that a chemical examination of the fæces should be made in cases where the morphine-habit is suspected but is denied by the patient, and where for various reasons it is difficult to secure conclusive evidence of the fact in other ways.

A New Clinical Method for the Estimation of the Alkalinity of the Blood. (*Centralblatt für die medicinischen Wissenschaften*, November 17, 1894.) By Carl Schultz-Schultzenstein.

Mylius has found that a rose-coloration takes place in blood, like any other weakly alkaline fluid, when it is mixed with neutral water and an ethereal solution of erythrosin added. The degree of alkalinity can then easily be determined by trituration with sulphuric acid.

The writer considers the following method to be thoroughly practical without the necessity of drawing more blood than is usually done for the purpose of the various methods now in use for the estimation of the hæmoglobin of the blood. Merck has prepared according to the formula of Mylius an ethereal solution of erythrosin as an indicator. (*Berichte der deutschen chem. Gesellschaft*, vol. xxiv. pp. 1484.)

As distilled water is of an alkaline reaction it must be carefully neutralized before using. The $\frac{1}{10}$ normal solution of sulphuric acid and potassium hydrate is prepared of $\frac{1}{600}$ strength, or, in other words, $\frac{1}{600}$ of forty-nine grammes of sulphuric acid (0.0817 gramme) is dissolved in water and diluted to one thousand cubic centimetres. This is designated as a $\frac{N}{600}$ solution. The blood is drawn in the usual manner by sticking the cleansed tip of a finger, and a capillary tube such as is employed in the Fleisell's hæmometer and holding 7.5 milligrammes is used to suck up the blood, which is then blown out into a glass-stoppered flask graduated into cubic centimetres, and diluted to twelve cubic centimetres with the neutral

water. To the diluted blood are then added 1.5 cubic centimetres of a $\frac{N}{600}$ sulphuric acid solution, by means of which the fluid is rendered distinctly acid. After thorough mixing erythrosin indicator is added, and the whole is treated with a $\frac{N}{600}$ potassium hydrate solution until the slightest rose tint appears; this is then caused to disappear by the careful addition of the $\frac{N}{600}$ sulphuric acid solution. The difference between the amount of the $\frac{N}{600}$ alkaline and acid solution used gives the amount of $\frac{N}{600}$ sulphuric acid necessary to overcome the alkalinity of the blood.

The following practical example is given: 7.5 milligrammes of blood drawn from a healthy man were diluted to twelve cubic centimetres by the addition of the neutral water. By means of a burette 1.5 cubic centimetres of $\frac{N}{600}$ sulphuric acid solution were run in, and five to six cubic centimetres of the indicator, the ethereal solution of erythrosin, added. The rose color was not visible, but appeared on the addition of 1.2 cubic centimetres of a $\frac{N}{600}$ potassium hydrate solution. In order to cause this color to disappear it took 0.4 cubic centimetre of the $\frac{N}{600}$ sulphuric acid solution. As there were used 1.9 cubic centimetres of the $\frac{N}{600}$ sulphuric acid solution and 1.2 of the $\frac{N}{600}$ potassium hydrate solution, it required 0.7 cubic centimetre of the $\frac{N}{600}$ sulphuric acid solution to overcome the alkalinity of the 7.5 milligrammes of blood, this corresponding to 0.62 gramme of sodium hydrate in one hundred grammes of blood, for one litre of $\frac{N}{600}$ sulphuric acid solution contains 0.0817 gramme of sulphuric acid. A tenth of a cubic centimetre would contain 0.00000817 gramme sulphuric acid, and the amount employed (0.7 cubic centimetre) would be seven times this, or 0.00005719 sulphuric acid.

0.0075 gramme blood: 0.00005719 gramme H_2SO_4 :: 100 : $x = 0.76 H_2SO_4$,

and in order to reduce to sodium hydrate,

98 grammes H_2SO_4 : 80 grammes NaOH :: 0.76 gramme H_2SO_4 : y grammes of NaOH
 $= 0.62$ per cent. solution hydrate,—which is the normal alkalinity of the blood three to four hours after a meal.

Leucocytes in Malarial Fever. (*Johns Hopkins Hospital Bulletin*, October, 1894.) By John S. Billings, Jr., M.D.

In tertian cases of malarial fever there is noted a uniform diminution in the number of the leucocytes during the febrile paroxysm. The maximum number of leucocytes is found, as a rule, two or three hours after the chill. There then follows a progressive diminution until the minimum number of leucocytes is reached at the end of the paroxysm, when the temperature is subnormal. The number of leucocytes then rises somewhat, and during the interval occupies a position about midway between the maximum and minimum above mentioned.

While the occurrence of a leucocytosis in most secondary anæmias is the rule, it is never very marked in malarial anæmia, rarely being above 15,000 to 18,000. In four cases which were under observation the increase in the number of leucocytes was striking. In two cases where the red corpuscles

ranged just above 3,000,000 per cubic millimetre the leucocytes were 28,000 and 30,000 respectively. In another case the red corpuscles were just under 2,000,000, while the leucocytes reached 40,000. In the fourth case the red corpuscles were 3,600,000, a relatively mild anæmia, while the leucocytes ranged above 20,000 for a week. In all four cases the increase was solely in the polynuclear leucocytes.

Fatal Case of Uncomplicated Chicken-Pox. (*Australasian Medical Gazette*, November 15, 1895.) By W. B. Nisbet, M.B., of Townsville, Queensland.

The disease progressed in the ordinary way for three days, but on the fourth day a new crop of vesicles appeared, which were so numerous that by the sixth day every part of the body was covered. On the seventh day spots appeared on the tongue, the hard and soft palates, and the inside of the cheeks. These spots changed to irritable ulcers on the ninth day, and the child—a baby girl, eight and one-half months of age—died on the morning of the tenth day.

The writer thinks that death was due to the large area of skin involved, which caused such extreme exhaustion that when the temperature fell to normal no amount of stimulation was able to avert the fatal issue. The diagnosis was confirmed by the fact that four of the older children in the same family had been affected with the disease.

The Normal Præcordia in Childhood. (*Archives of Pediatrics*, November, 1894.) By H. B. Whitney, M.D., of Denver, Colorado.

The frequency of endocarditis and pericarditis in children, and the fact that an accurate diagnosis depends largely upon the percussion signs, merits, according to Dr. Whitney, a more careful study of the normal præcordia in childhood than has hitherto been made. In a careful search through the literature on this subject he finds nothing which at all approximates a full and accurate statement of the facts. Observations made by the writer upon a comparatively large number of children have led to the following conclusions: 1. In children, until the beginning of the sixth year, the relative dulness of the normal heart has practically the same limits as in the adult,—namely, above and to the left, a curved line extending from the junction of the third rib and the sternum outward and downward to the apex of the heart in the fourth interspace near the mammary line; the right boundary a perpendicular line corresponding very nearly with the left border of the sternum. The lower half of the sternum is therefore of the same resonance as the upper half in children under six years of age. 2. From the fifth to the ninth year the præcordial dulness varies in different cases. A considerable majority between these years have a præcordia which does not differ from that found in infancy and adult life. At five years all the cases which Whitney examined had a præcordial dulness corresponding to that found in infantile life. At six years there were two infantile to every one enlarged;

at seven there was about an equal number of each. At eight there were three enlarged to every two infantile. At the age of nine the infantile præcordia had entirely disappeared. During the period, therefore, from the fifth to the ninth year the diagnostic value of præcordial dulness *per se* must prove equivocal. 3. In children over eight years and up to the age of puberty the limits of the normal præcordia are invariably found to differ widely from those of the first half of childhood and of adult life. The upper border is generally higher. It is often as high as the second interspace, and occasionally as high as the second rib. The apex is usually a quarter to a half an inch outside the mammary line. The right border, instead of being a perpendicular along the left edge of the sternum, is a curved line which meets the line of liver dulness at a point outside of the right sternal edge one and a quarter to one and a half inches to the right of the median line. The outline is somewhat similar to that of a pericardial effusion.

In outlining cardiac dulness the writer calls attention to the following points: 1. Only light percussion should be used, as with a heavy stroke vibration of distant parts obscures the tone given by the tissues beneath the finger. 2. The exact point of change of note should be marked on the chest. Percussion should first be practised from the centre of the præcordia towards the periphery, and then backward from normal pulmonary resonance to the centre. 3. In the second half of childhood the resonance of the lower half of the sternum should be compared, not with the pulmonary resonance at its right border, but with that of its upper half. To determine, therefore, whether the right limit of præcordial dulness extends beyond the left border of the sternum, percussion should be made along the sternum from above downward as far as the horizontal line of hepatic flatness at the level of the sixth rib. Any encroachment of the præcordia upon this so-called cardio-hepatic angle is, except in the latter half of childhood, pathological.

THERAPEUTICS.

IN CHARGE OF ALEXANDER D. BLACKADER, B.A., M.D.,

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ASSISTED BY

D. I. EVANS, M.D.

Chloride of Calcium in the Treatment of Acute Pneumonia.
(*Medical Chronicle*, December, 1894.)

In 1893 Dr. A. Crombie first called attention to the value of this drug in the treatment of pneumonia in a paper read before the Calcutta Medical Society, and in an article in *The Practitioner* of November, 1894, Dr. D. M. Moir reports cases treated by the same drug, apparently with much success.

The remarkable features in the results are, the subsidence of the fever after two or three days' treatment to a practically normal point, notwithstanding the continuance of the physical signs; the singular freedom from the distress and anxiety often associated with high temperatures; and, according to Dr. Crombie, an arrest of the disease in the stage in which it happened to be when the treatment was begun. Dr. Crombie thinks his results with calcium chloride closely resemble those obtained by the brothers Klemperer after use of the serum containing anti-pneumotoxin. He refers to the work of Green on the power of calcium salts in hastening the coagulation of blood, and the discovery of Pekelharing that peptones have a strong affinity for the calcium salts, and that the poisonous action of peptones, etc., is due to their removing from the tissues calcium salts, which are essential for nearly all the vital processes. He thinks it not impossible that the action of the chloride of calcium may consist in its neutralizing the toxic action of the peptones or albumoses circulating in the blood. He recommends that the chloride should be given in doses for adults ranging from five to fifteen grains every four hours.

On the Physiological Action of Pyridin. (*Journal of Physiology*, October, 1894.) By T. L. Brunton, M.D., and F. W. Tunnicliffe, M.D.

The physiological action of pyridin is of importance, because it may be regarded as the nucleus of many organic alkaloids. On frogs, even in small doses, the drug has a general narcotic influence. When introduced into the general system pyridin paralyzes the sensory nerve endings and the sensory spinal centres, or possibly the intermediate fibres, leaving the motor cells, efferent nerve, and motor nerve endings intact, at least in frogs. It has a marked action upon the automatic respiratory centre; the respirations first becoming slower and shallower, then irregular; finally ending in respiratory failure. In small doses it has a stimulating, but in large doses a direct paralyzing, action on the cardiac muscle.

On the Toxic Effects of Borax. (*La Semaine Médicale*, November 3, 1894.) By G. Féré, M.D.

This writer, after a six years' trial of borax in varying doses in cases of epilepsy, finds it far inferior to potassium bromide in efficacy, while its toxic effects are much more pronounced. Gastro-intestinal disturbances are the most frequent, and generally the earliest to appear. Nausea and vomiting may appear after the first dose, and, if the drug be persevered with, complete anorexia, with sensations of heat and weight at the epigastrium, and pains in the head, ensues. A peculiar dryness of the skin and mucous membrane, with reddened and denuded epithelium of the lips and tongue, is also noted. The skin loses its fat, and this may give rise to an alopecia first of the scalp, but which may in time become general. Rashes of an eczematous or papular character may make their appearance. Cachexia, emacia-

tion, and œdema of the face and extremities, and a urine loaded with albumin, indicate the gravity of the toxæmia.

The Use of Medullary Glyceride in Conditions attended by Paucity of the Red Corpuscles and Hæmoglobin. (*New York Medical Journal*, January 12, 1895.) By A. McLane Hamilton, M.D.

The results of the use of bone marrow by Frazer and others have induced the writer to experiment with this agent during the past few months, and he has been impressed with its efficacy in certain conditions dependent upon a depraved condition of the blood. The cases selected for treatment with bone marrow presented varying forms of red corpuscle poverty, with diminution of hæmoglobin, most of which were obstinate, and had resisted arsenic, iron, and other hæmians. In every case a careful determination was made before, during, and after treatment of both the red corpuscles and the amount of hæmoglobin. In two or three cases poikilocytosis was present. Under the treatment a great and rapid proliferation of the red corpuscles was noted, in some cases the normal number being greatly exceeded. He thinks it reasonable to ascribe this rapid and extraordinary increase to the direct influence of the medullary extract. The immediate improvement in the state of the blood and the subsidence of the symptoms are no less wonderful than the improvement which follows the use of thyroidal extract in myxœdema, though the gain is more permanent than in the latter. He made use of two forms of marrow, that obtained from the long bones, which was given raw, and that from the short ribs, which was given as a glyceride. He thinks his best results were obtained from the marrow contained in the ribs of a young animal. The coarse marrow from the long bones contains a great deal of fat, which, while beneficial in itself, does not contain the specific virtues to the same extent as the finer medullary substance. The glyceride was administered alone, and, as a rule, the good effects were apparent within a few days. In only one case did it fail.

A Study of Erysipelas, and its Curative Influence upon Granulating Surfaces and upon Sarcomatous Growths. (*New York Medical Journal*, December 29, 1894.) By Julius Selva, M.D.

In this paper the writer gives us the result of accidental and artificial inoculations with the streptococci of erysipelas in cases occurring in the Boston City Hospital. His conclusions are as follows: 1. The general infectious nature of erysipelas and its dangers should always be borne in mind. Marked prostration, cerebral symptoms, and septicæmia are not infrequent complications. 2. Accidental erysipelas has a curative influence upon granulating surfaces, but its use in the treatment of ulcers would be unjustifiable. 3. In the treatment of neoplasms by inoculation with the streptococci of erysipelas we have a therapeutic agent which should not be used indiscriminately. 4. Further investigations with the toxins of erysipelas are necessary for the resolution of this important problem.

Treatment of Inoperable Tumors with the Toxins of Erysipelas and the Bacillus Prodigiosus. (*American Journal of the Medical Sciences*, July, 1894.) By William B. Coley, M.D.

The writer in this interesting paper states that he was early convinced of the danger attending an attack of erysipelas from inoculation, and of the fact that a certain portion, if not all, of the improvement was due to the toxic products of the streptococcus rather than to the germ itself. Hence in all these later cases he has used toxins rather than the living bacteria. He has found also that the toxins of the bacillus prodigiosus greatly enhance the curative action of the streptococci of erysipelas. He says, in view of the results which he has obtained from the toxins of erysipelas and prodigiosus, which can be used with perfect safety and scientific accuracy, he considers it inadvisable to expose a patient to the risk attending an attack of erysipelas. He formulates his conclusions as follows: 1. The curative action of erysipelas upon malignant tumors is an established fact. 2. This action is much more powerful in cases of sarcoma than of carcinoma. 3. This action is due to the toxins of the erysipelas streptococcus, which may be isolated and used with safety. 4. This action is much increased by the addition of the toxins of bacillus prodigiosus. 5. The toxins to be of value should come from virulent cultures and be freshly prepared.

Therapeutic Value of Salicylate of Strontium. (*British Medical Journal*, January 5, 1895.) By H. C. Wood, M.D., of Philadelphia.

In a short note the writer calls attention to this drug as a valuable addition to every-day therapeutics. He says that after using the lactate, iodide, and bromide of strontium freely, he came to the conclusion that the strontium element materially modifies the action of haloïd bodies on the alimentary canal. This suggested the possibility that strontium might modify the action of salicylic acid. From experiments upon dogs he determined that in therapeutic doses it elevates the arterial pressure, and in large doses is much less depressing than either the sodium or ammonium salt. He has since then used it freely in practice, and finds that in doses of five grains it is one of the best intestinal antiseptics; in doses of ten or fifteen grains it acts very decidedly as a salicylate in gouty and chronic rheumatic conditions, without producing disturbance of the stomach. It appears to be less active in acute cases than is the ammonium salicylate, but in chronic gouty conditions with lithæmia it appears to be the most valuable drug that we have.

SURGERY.

IN CHARGE OF HENRY R. WHARTON, M.D.,

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AND

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A Dumb-Bell-Shaped Calculus which had been partially encysted removed by Lithotomy. (Meeting of the Philadelphia Academy of Surgery, December 3, 1894.)—Dr. H. R. Wharton exhibited a calculus which he had removed from a child five or six years of age. By rectal examination the stone was felt in a prolongation of the bladder into the rectum. A lateral lithotomy was performed, but upon attempting to remove the stone, its posterior portion was found to be encysted in the walls of the bladder. It was dissected out with the finger, however, without breaking it. Wharton calls attention to the difficulty of crushing stones under such circumstances, and thinks that much information regarding the shape and possible attachments of the stone may be gotten by rectal exploration.

Castration in Hypertrophy of the Prostate Gland. (*University Medical Magazine*, February, 1895.) Editorial.

From the post-mortem findings of Sir Henry Thompson, which showed that one man of every three over fifty-four years of age had some enlargement of the prostate, one in every seven had some degree of obstruction, and one in fifteen had sufficient enlargement to demand treatment, it is believed that there are to-day in this country two hundred thousand sufferers from hypertrophy of this gland. Though the lives of such patients are imperilled by retention of urine and consequent fermentative changes, backward pressure on the kidneys, frequent catheterization, and loss of sleep, surgeons have been unable to afford distinct relief. Even if the patient's condition warranted prostatectomy, the operation is a very grave one, while prostatotomy is little more than a palliative. Hence it is not strange that the suggestion of Professor J. William White at the annual meeting of the American Surgical Association, June 1, 1893, that atrophy of the prostate may be brought about by removal of the testicles, should have been favorably received by surgeons having under their care patients suffering from this intractable malady. Cases of prostatic hypertrophy in which castration had been done were soon after reported by Ramm, of Norway, Haynes, of California, White, of Philadelphia, and others. All the eighteen cases thus far published were successful, and usually the shrinking of the prostate and the relief from the distressing symptoms have been

marvellous. Quite as many unpublished cases have also been operated upon, with equally favorable results. Castration is not, however, indicated in every case of prostatic enlargement. Prostatic abscess, prostatitis, tumors of the prostate and of the region of the neck of the bladder, etc., must be distinguished from true prostatic hypertrophy, or disappointment will result, and the operation be unjustly discredited.

Is the Apposition of Peritoneum to Peritoneum a Surgical Error ? (*British Medical Journal*, January 5, 1895.) By J. Greig Smith, M.B., of Bristol, England.

During the past two years Smith has deliberately and intentionally, where possible, acted as if it were wrong to approximate peritoneum with peritoneum, and the result of his experience has been to convince him that for all purposes where sound, speedy, permanent union is desired, the apposition of two intact serous surfaces is a surgical mistake. Where the union sought need not be strong and is desired to be only temporary, sero-serous apposition may be adopted. As intestinal evacuation and drainage in obstruction was introduced by this author, he has become responsible for the healing of a considerable number of cases of intestinal fistula and artificial anus. This is managed by an extra-peritoneal operation, made possible by detaching the parietal peritoneum for some distance around the fistula. The parietal peritoneum, still adherent to gut, being detached, the bowel with the peritoneum can easily be delivered through an incision traversing the cutaneous and muscular layers, and the opening, large or small in the gut, is closed by apposition of raw surfaces. Sero-fibrous apposition, or apposition of a peritoneal surface on the raw wound, is carried out in such operations as gastrostomy, hysteropexy, enterostomy, colostomy, cholecystostomy, and the numerous operations which involve the drainage of cysts and abscesses. The author believes that the same rule would probably hold good with regard to intestinal surgery.

A Case of Sarcoma of the Palate successfully treated with the Toxins of Erysipelas. (*Medical Record*, November 17, 1894.) By Walter B. Johnson, M.D., of Paterson, N. J.

A male, aged sixteen, with no history of any hereditary taint or acquired syphilis, had always suffered from catarrhal trouble and hypertrophy of the tonsils, and generally during the winter had more or less frequent attacks of acute tonsillitis. A tumor of the palate was allowed to reach a considerable size before any medical opinion was sought.

On examination, a diseased area was disclosed which extended over the entire soft palate, pillars of the fauces, region of the tonsils, forward over the hard palate to within one-half inch of the incisor teeth, backward and downward, involving a portion of the pharyngeal wall, base of the tongue, affecting the epiglottis, and invading the upper part of the larynx, but not extending to the true vocal cords. The infected parts were thoroughly

impregnated with sarcomatous (microscopically found to be of the spindle-celled variety) deposit, the soft palate was increased to about three times its normal thickness, the new tissue consisted of cauliflower-like granulations varying in size from a rice kernel to a good-sized pea; some of the masses which made up the growth were undergoing an apparently superficial ulceration and discharging a purulent secretion; others contained distended and tortuous vessels which gave them the dusky hue frequently observed in sarcomatous diseases; the uvula seemed to have been destroyed. There were several of the cervical glands involved; the largest one, however, was only about the size of a filbert.

The injections of the toxins of erysipelas were commenced daily with fifteen minims. The dose was increased each day until it had reached sixty minims. The bacillus prodigiosus toxins were used in doses of five minims in combination after the dose had reached thirty-five minims. The injections were sometimes given in the arm and sometimes in the leg, and generally caused redness, swelling, and pain almost immediately after they were given; these symptoms were always present and persisted from twelve to thirty-six hours. The temperature varied. It was elevated after each injection, to a greater or lesser degree, from 99° to 103° F. The patient always felt cold, and after some of the injections had chills, some of which were much more severe than others, and were accompanied by nausea, vomiting, and pain in the back of the head and neck. When the chills or feeling of coldness had passed away a profuse perspiration would follow, and the condition of the patient would become much more comfortable. The treatment was continued from October 31, 1893, to June, 1894, the untoward effects noted during that time being the chills, a severe herpetic eruption on the nose and lips, a sense at times of soreness of the body, and a peculiar variety of keratitis of a very severe type, the entire cornea being opaque.

The result of the treatment was a constant, steady, but slow, improvement in his condition, the sarcomatous material gradually disappearing, and at the time of writing, nearly one year after the injections were commenced, the patient is in an excellent physical condition, only one or two spots of ulceration remaining, his weight having increased from eighty-six pounds to one hundred and seven. The uvula and a small portion of the epiglottis were destroyed by ulceration, cicatrization and contraction have taken place, and white bands of adhesion extend from the hard palate to all parts of the fauces.

Endemic Cancer. (*Birmingham Medical Review*, October, 1894.)
By T. Law Webb, L.R.C.P.

Several years ago Webb reported in the same journal six cases of cancer occurring in two dwellings under one roof, and also mentioned another series of three cases treated in one cottage. Other instances of a sequence of cancer cases are now reported from this immediate neighborhood.

Among the number of examples cited may be mentioned the following case: An accountant died from cancer of the breast in 1869. His house-keeper died in the same house from cancer of the stomach in 1885, while, in 1894, the gentleman who succeeded to the duties of the deceased accountant succumbed to cancer of the tongue complicated with disease of the lungs. He occupied the same rooms as his predecessor. The water used for drinking purposes is supposed to be responsible for so many cases occurring in one district.

Two Cysts of Unusual Origin. (*Bristol Medico-Chirurgical Journal*, September, 1894.) By Charles A. Morton, F.R.C.S., of Bristol, England.

Implantation cysts (as Bland Sutton calls them) are tumors caused by the implantation of a portion of epidermis into the subcutaneous tissue, where it grows into a cyst, resembling a dermoid. They always result from injury. Similar cysts are sometimes found in the eye from implantation of an eyelash or portion of corneal epithelium.

A woman, thirty-four years of age, ran a thorn into her thigh when a little girl, and ever since there had been a minute opening where the thorn perforated. During the last year a hard swelling had formed around this, which had given her a good deal of pain. There was a perfectly circular opening in the skin the size of a sixpenny piece, with smooth thin edges, through which could be felt a black hard mass, with a minute central depression in it, which extended some distance under the surrounding skin. This condition had been present for only a year. On slitting up the opening the black mass was easily shelled out. It was then seen to have been contained in a thin-walled cyst, which was without much difficulty dissected out. Its inner surface was white and shining. On making a section of the black mass, the centre was seen to be amber colored with a still more central depression in it, about the size and shape of a small needle's point, evidently where the thorn had been. The mass was so hard it could only be cut with a knife by using great force. After being in spirit a few days a very remarkable change took place in it. It greatly increased in size, softened, and split up into innumerable laminæ, like the layers of an onion. Microscopically the structure was that of corneous epithelium.

The second cyst was formed around a foreign body in a boy, aged thirteen, who had a swelling in the hand. During the previous June he had fallen off a wall and cut his hand against a stone. He went to a doctor, who examined it and told his mother to poultice it in case it contained any foreign body. The wound healed in a week, but a little swelling remained, which gave him slight pain when he played cricket, but only at such times. During the last three weeks, however, it had steadily increased in size and caused him considerable pain on moving his hand in writing. Over the centre of the annular ligament was a round soft swelling with a very hard irregular centre, lying under a scar in the skin. When pressure was made on the hard body it pricked him. The soft swelling was a fibrous cyst

with a smooth inner surface containing a little serous fluid, in which was lying a piece of glass half an inch in diameter. After the removal of the glass the thickening caused by the cyst-wall almost completely disappeared, and he could use his hand quite well. This was a cyst formed from condensation of the surrounding tissues from irritation of the foreign body. It is remarkable how long the glass lay embedded without causing discomfort, and, the complete ignorance on the part of the boy that there had been any glass about when he cut his hand is very surprising. Perhaps so long as the glass was firmly embedded no pain was caused; but as soon as a space containing fluid was formed around it movement became possible, and hence the pain. The pain and rapid increase in size certainly went together, the latter indicating probably the cyst formation.

The Treatment of Bleeding from the Nose. (*New York Medical Journal*, November 17, 1894.)—The *Revue internationale de rhinologie, otologie, et laryngologie* for August 10, publishes an article by Dr. Baumgarten, of Budapest, in which he recommends the following methods in the treatment of epistaxis: A thorough examination of the inside of the nose must be made in order to discover where the bleeding comes from. Usually there are to be seen at the anterior part of the septum, rarely elsewhere, one or more small superficial vessels of a red color, or else little nodules, erosions, and varicose veins, or a small empty vessel looking blackish on a red background. Occasionally the hemorrhagic spot is covered with fresh blood-crusts, which must be softened and carefully raised in order to expose the appearances referred to. If there is nothing of a suspicious nature to be seen, the patient must be made to blow his nose several times. Another method is to apply a tampon of wet cotton to the septum, and press it more and more firmly against the place until the morbid spot bleeds. Sometimes this brings on at once a more abundant hemorrhage, which makes the continued application of the tampon necessary before the bleeding spot can be destroyed. For its destruction the author has used the galvanic cautery or chromic acid, sometimes both. He touches the spot with the cautery, which is very painful, and the wire loop cannot always be withdrawn while it is still red, so that the eschar is apt to be removed at the same time. Then the small wound bleeds feebly, and it should be cauterized with chromic acid, which, according to Dr. Bresgen, is an excellent hemostatic. When operating on children or on timid persons Dr. Baumgarten uses the chromic acid only, but the cauterizations must be repeated two or more times after the eschar has fallen or after a fresh hemorrhage. This treatment must be continued until a plainly visible cicatrix is produced. The patient must be told not to scratch the eschar, to apply a little oil or grease to the spot, to keep quiet, to avoid handling his nose, and not to blow it too hard.

Sometimes sneezing occurs, and this may bring on a hemorrhage through the eschar. In this case the application must be renewed. A hemorrhage

must always be arrested before cauterizing the spot from which it proceeds. After the source of the hemorrhage has been ascertained the spot is washed with warm water, the nostril is dilated, and as large a tampon as possible is inserted, against which the wing of the nostril is pressed with the finger. That generally suffices, as nearly all forms of epistaxis have their origin in the forepart of the nasal passages, but the patient must hold himself erect and remain quiet. After this pressure has been continued for a moment the tampon is slowly withdrawn in order to find the origin of the hemorrhage. A second tampon is then pressed against the spot. The epistaxis is thus often arrested. Afterwards the place may be cauterized with chromic acid. The author has often succeeded in covering the bloody points with a layer of chromic acid by pushing the tampon forward very gently; it cannot always be removed immediately, because the wound will bleed anew, and it must be left until the following day or longer if necessary. The author, however, has never had to repeat this for more than three days. He always uses cotton saturated with carbolic acid or some other aseptic cotton, but never iron perchloride, as that only cauterizes.

If the blood runs through the tampon or into the pharynx, the physician should use the same means as those employed in the more serious hemorrhages. After the part has been washed with warm water, a strip of iodoform gauze as wide as a finger should be pushed as far as the choana; then the entire nasal fossa should be packed with the same material. This may be done easily and without pain; it is better than Belloq's method, and may be accomplished even with a contracted nostril. With regard to Belloq's method, Dr. Baumgarten thinks it is not sufficient and that it may produce accidents to the ear, etc. In one case, that of an old man who was the subject of advanced arterio-sclerosis, Belloq's tampon was inserted, and several tampons were added anteriorly. Two physicians had tried to stop the bleeding, but their efforts had been of no avail. The velum of the palate had been cut, and it was ulcerated and œdematous. The author, who was called in, immediately removed everything, and while the bleeding continued he applied strips of iodoform gauze, and two days afterwards the hemorrhage was arrested.

As a palliative method, or in cases where the anterior tampon is not efficacious, or where the patient is taking care of himself pending the physician's arrival, the author recommends the use of warm water, which is a better hæmostatic than cold water or ice water, or else lemon juice. A solution of iron perchloride is an excellent hæmostatic, he says, but it cauterizes the neighboring region and prevents the physician from distinguishing the diseased spot.

When the hemorrhage finally stops, and the bleeding points are found, they must be cauterized. There is no harm in cauterizing somewhat around the bleeding spot; on the contrary, the indications are to burn the entire vicinity. In cases of arterio-sclerosis the author has been obliged to cauterize the entire pituitary surface as far as the choana, as the iodoformed

strips were removed one after another. These cauterizations should be repeated several times, and every suspected place covered anew with chromic acid. These tampons of iodoform gauze are not disagreeable to the patient, and they may be left for two days. Before removing them the nose should be washed with warm water, and the strips of gauze should be drawn away very gently in order to prevent the hemorrhage from breaking out again, and any suspected places immediately cauterized, even at the risk of touching a healthy spot. The patient may take wine and iron, but should avoid coffee, tea, and effervescing drinks. All internal medicines are useless and harmful.

An Improved Method of the Radical Operation for Carcinoma of the Breast. (*New York Medical Record*, December 15, 1894.) By Willy Meyer, M.D., of New York.

The operation is performed as follows: A skin incision embracing a liberal area around the nipple and running across the axilla to the point of insertion of the tendon of the pectoralis major muscle is made. A second incision is made at right angles to the one just described, running to the junction of the middle and outer thirds of the clavicle. After the skin-flaps are reflected the tendons of insertion of the pectoralis major and minor muscles are divided, and these muscles, the axillary, subclavicular, and infraclavicular fat and lymphatics, and the diseased breast are removed in one mass. The muscles are separated from their points of origin, and the new growth is not cut into during the operation. The vessels entering the pectoralis major muscle are clamped before they are cut. The wound is sutured as far as possible and axillary drainage is used.

Three Cases of Intracranial Abscess; Recovery in Each Case. (*British Medical Journal*, January 5, 1895.) By Robert W. Murray, F.R.C.S., of Liverpool.

The author reports three cases of intracranial abscess with trephining, evacuation of pus, and recovery in each. The first case was caused by a punctured fracture of the skull made by the sharp end of a poker. Before operation the child had loss of power in the left hand and epileptic seizures affecting the left arm and the left side of the face. The abscess was in the motor region, at the junction of the upper and middle thirds of the fissure of Rolando, and contained one drachm of pus. The recovery was uninterrupted, and the patient was perfectly well three and a half years after the operation. The second case was caused by middle-ear disease. Before operation there was a divergent squint in left eye, left pupil was dilated, and right-sided facial palsy and double optic neuritis were present. The abscess was situated in the temporo-sphenoidal lobe and contained three ounces of pus. Recovery was uneventful, and the patient was well one year after the operation. The third case was also due to middle-ear disease. Before operation the patient presented double optic neuritis, vomit

ing, severe frontal headache, and sighing respiration. The abscess was situated in the cerebellum and contained six drachms of pus. Recovery was prompt, and patient's health was fully restored six months after the operation. In this case a subperiosteal abscess over the mastoid process and an extradural abscess on the sigmoid sinus were opened previously to the opening of the cerebellar abscess.

Embolism and Thrombosis of the Mesenteric Blood-Vessels.
(*Boston Medical and Surgical Journal*, December 6, 1894.)

Watson has collected eight cases of thrombosis of the mesenteric blood-vessels which have occurred in Boston during the past year. To these are added six other cases found since 1886 in the records of the Boston City Hospital. Of these fourteen cases one, Eliot's patient, recovered, four feet of the small intestine being resected. It is claimed that this is the first successful result of surgical intervention in this disease. Twenty-seven out of the fifty-two cases found in the literature and hospital records have clinical histories attached; these are carefully analyzed for the possibility of making a diagnosis, and as to the chance of saving life by surgical operation.

With regard to the diagnosis there are certain symptoms which, when associated, are fairly though not positively characteristic. They seem to me to be, in the order of their importance, as follows: 1. Colicky, very intense, not definitely localized, abdominal pain. 2. Bloody diarrhoea. 3. Subnormal temperature. Vomiting if present (and next to pain it is the most frequent symptom) strengthens the diagnosis, as do also abdominal distention and marked prostration; but the first two or first three symptoms, when occurring in combination, are the only ones that can be called in any sense characteristic. Pain is the first symptom more often than any other, and its intense character is dwelt on by several authors. There is often evidence, as pointed out by Gerhardt and Kussmaul, of embolism elsewhere in the body, and the coexistence of cardiac disease and atheromatous arteries is also affirmatory in connection with the above-mentioned symptoms. As to the benefits to be derived for a surgical operation, about one-sixth of the cases showed at the autopsy that the intestinal lesion was sufficiently limited and well defined to allow of a successful resection of that part of the bowel. Most of the patients were beyond middle-life, and in these there was a coexistence of other diseases, such as atheromatous arteries and cardiac and renal disease. In some of the cases below middle-life no source of the embolus could be discovered. As practically all the patients die when left to themselves or under any form of medical treatment, it may be concluded that laparotomy is indicated in all cases in which the symptoms suggest the nature of the disease, and in which the patient is not too greatly prostrated or has not some other fatal disease.

Lothrop also reported a synopsis of three cases which he had recently observed in one of the Vienna hospitals. From these he considers the symptoms of the late stage to be: 1. Sudden abdominal pain over a con-

siderable area, generally including the umbilical region. 2. Nausea and vomiting,—vomitus in late stages containing blood. 3. General abdominal tenderness. 4. Diarrhœa, a rather late symptom. Stools apt to contain blood if patient survives for several days. 5. Shock with constitutional disturbance, such as would be looked for in any case of acute intestinal obstruction.

Given a case presenting such a group of symptoms, before arriving at a diagnosis of embolus of the superior mesenteric artery, we must consider and rule out such possibilities as,—1, volvulus; 2, intussusception; 3, strangulation from bands or cords; 4, herniæ of all kinds; 5, perforation of gastric or duodenal ulcer; 6, acute pancreatic affections.

As a further aid to diagnosis a complete physical examination should be made: the heart should be studied with reference to endocarditis; renal elements in the urine might suggest the possibility of embolus in the kidney; while old or recent cerebral symptoms might indicate the possibility of cerebral embolus as well as an atheromatous condition of the blood-vessels.

Prognosis depends upon (a) general symptoms, as to whether the patient has strength sufficient to withstand the shock, both of the attack and that necessarily consequent on any operative procedure; (b) local conditions, such as the character and seat of the embolus. A septic embolus would almost inevitably result in a fatal peritonitis. A bland embolus would be more or less serious according to its point of arrest in the artery.

For the sake of classification Lothrop considers three conditions: 1. Embolus sufficiently large to obstruct the artery near its origin. Death would seem inevitable, for this would cause a sudden loss of blood-supply to the jejunum, ileum, and ascending and transverse colon. 2. Embolus in the main trunk of the artery, but distal to the ileo-colic and several of the "intestinal branches." Death to be expected from peritonitis as a result of gangrene and perforation if left alone. Life may be saved by operative intervention and the necrotic intestine resected. 3. If the embolus is sufficiently small to find its way into one of the "intestinal branches," no serious secondary results need be feared, for the collateral circulation is very free, as seen by the diagram, and the condition is as trivial as an embolus in one of the smaller branches of an artery supplying an extremity.

Autopsies reveal to us that emboli emanating from the left heart are by no means rare occurrences; and I believe that the reason why we so seldom hear from them in the superior mesenteric artery is because they are either too large to enter that artery or are too small to obstruct its main trunk, but pass on to a point of arrest where the collateral circulation is well provided for.

In regard to treatment. Disastrous results which would otherwise come from small emboli are guarded against by nature.

If embolus is *diagnosed*, operate, for neglect is sure death.

If embolus is *suspected*, operate, for the dangers of an exploratory laparotomy in well-appointed hospitals are less than the risk incurred by expectant treatment.

The Treatment of Gonorrhœa by Irrigation of the Urethra. (*Therapeutic Gazette*, November 15, 1894.) By H. M. Christian, M.D., of Philadelphia.

The results reached in the treatment of these cases seem to warrant, according to Dr. Christian, the following conclusions: 1. That irrigation is a distinct advance in the treatment of gonorrhœa; in fact, up to a certain point it must be considered the proper treatment for that disease. It relieves *ardor urinae* and chordee more promptly than any other form of treatment. It is attended with a much smaller proportion of complications such as total urethritis and epididymitis. 2. That permanganate of potassium is the best remedy for the purpose of urethral irrigation. 3. That irrigation alone cannot be relied upon to absolutely cure specific urethritis. For the cure of the thin muco-purulent discharge which appears at the meatus in the morning, some astringent injection used by the patient himself is necessary. 4. That simple non-infectious urethritis can be cured in from ten to twelve days by daily irrigations with permanganate of potassium. The writer is of the opinion that, where it is possible to carry out irrigation of the urethra with permanganate of potassium solution *twice* daily, this procedure very materially lessens the duration of the disease. The solutions used were as follows: bichloride of mercury, 1 to 15,000, increasing the second week to 1 to 8000; nitrate of silver, 1 to 6000, increasing to 1 to 3000; permanganate of potassium, 1 to 4000, increasing to 1 to 2000; trikresol, one-half to one per cent.

Resection of the Trachea. (*Deut. Zeit. für Chir.*, vol. xl., Nos. 1 and 2, 1894.) By Fritz Colley, M.D., of Marburg.

From his experimental studies the author deduces the following conclusions:

1. Certain forms of stricture can be overcome only by resection of the affected region.
2. This excision is accomplished most easily by the removal of a bayonet-shaped portion, and not a circular or ring-shaped portion of the trachea.
3. By the removal of a portion of such shape the resulting cicatrix is placed in such a position that there will be one portion situated above and posteriorly while the other is below and anteriorly, and there will not follow the production of an annular diaphragm extending into the trachea, as results after a ring-shaped excision.
4. A prophylactic tracheotomy is not productive of good results.

Amputations through the Knee-Joint. (*Deut. Zeit. für Chir.*, vol. xl., Nos. 1 and 2, 1894.) By Rudolph Habs, M.D., of Magdeburg.

From the study of twenty cases of exarticulation which have occurred in the Magdeburg clinic during the last fifteen years the author draws the following conclusions:

The indications for operation were sarcoma in three cases, gangrene fol-

lowing the removal of a popliteal aneurism, chronic osteomyelitis of the tibia, and ulcus cruris, each one case. The remaining fourteen cases were rendered necessary by traumatism; eight were primary and six secondary amputations following a resulting phlegmon or gangrene. One case died which was septic before operation. Of the twenty cases, fourteen were males, six females; four patients were under fifteen and two over sixty years of age.

The operation employed in eighteen out of twenty cases was that of Velpeau, with a large anterior flap; sloughing occurred in two cases only, with slight marginal necrosis in three other cases. In but one case was there any difficulty from the scar lying over the point of pressure.

Of the two remaining cases, one operation by Bryant's method produced good results; while the other, by Blandin's method, resulted in a painful stump, as the musculo-cutaneous flaps retracted and drew the cicatrix over the point of pressure.

The Etiology of Suppurative Nephritis. (*Ziet. für Heilkunde aus Prag.*, vol. xv., Nos. 4 and 5, 1894.) By Von Wunschheim, of Prague.

From abundant clinical material and carefully-conducted experiments, this author comes to the following conclusions:

1. Pyelonephritis is the result in the great majority of cases of infection by the bacterium coli commune, in a fewer number of cases through proteus or the more ordinary forms of suppurative cocci.

2. In a certain number of cases in which the ordinary pyogenic microbes are the cause of irritation a consecutive pyæmia results.

3. Pyelonephritis resulting from the irritation of staphylococci and streptococci is not to be differentiated from the other forms alone by the pyæmia present, but also microscopically by the marked necrosis of tissue, and the absence of increased inflammatory tissue-formation which is produced by the bacterium coli commune.

4. It is not probable that the *typical* ascending pyelonephritis can be produced by the passage of micro-organisms from the bladder through the circulation.

NEUROLOGY.

IN CHARGE OF LANDON CARTER GRAY, M.D.,
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GUY HINSDALE, M.D.,
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AND

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New York City.

Graphic Methods of Representing Tremors. (Nouvelle methode graphique permettant d'enregistrer tous les Tremblements, etc. *Archives de Neurologie*, September, 1894.) By M. Le Filliatre, M.D.

Tremori nei Pazzi. (*Rev. sperimentale di Freniatria*, etc., November 1, 1894.) By Andrea Cristiani, M.D.

M. Filliatre has published an account of his studies on tremor, illustrated with tracings of absolute tremor recorded by an instrument of his own device. These records are preferable to records of relative tremor, specimens of which are also shown. The author uses two Marey's tambours, one of which is connected with the part to be studied by means of a horse-hair; the second tambour, connected with the first by rubber tubing, records on a revolving cylinder the actual amount of movement in the affected part. In all observations it is necessary to prevent a normal or pathological sway of the body by employing some means of fixation. In recording the tremor of the extremities, the instrument can, of course, record movement in only one plane.

Cristiani has published graphic representations of absolute tremor in twenty-two cases of insanity. He shows that the motor phenomena constituting the tremor have a perfect correspondence with the psychic phenomena as regards the two cardinal symptoms,—exaltation and depression. Thus the vibratory form of tremor, in which the movement is more rapid in rate, more extensive, more irregular, indicates among the insane a state of exaltation in which correspondingly are found excitation, instability, disorder of motor activity; while, on the other hand, in the state of depression we have the undulatory form of tremor, the movement less frequent, gentler, lower in its curve, more monotonous in rhythm, and more equal in the wave, corresponding to the depression and monotony of the psychic activity.

The Muscular Sense and its Location in the Brain Cortex. (*Psychological Review*, January, 1895.) By M. Allan Starr, M.D., of New York City.

The writer considers the following case to be of interest as it illustrates the possibility of producing an entire loss of muscular sense by a limited loss of brain cortex, without producing any disturbance in motor power or in tactile sensibility; the localization of the muscular sense centre for the hand is also determined to be in the parietal region.

A young epileptic man was brought to the hospital suffering from intense headache to the left of and somewhat behind the vertex. A severe fall on his head during his fifth year had caused disturbance of mental balance. He was easily excited and passionate, his powers of application were somewhat deficient; but his memory was good and he seemed fairly bright at his lessons. Another fall at sixteen years of age caused an increase in all his symptoms. The headache was very intense and constant and subject to sudden periods of increase, when the boy would develop a maniacal condition. After trephining and exposing the brain a small vascular tumor, about three-fourths of an inch in diameter, was found beneath the point of injury, and was removed without injury to the brain substance. The boy recovered rapidly and was quite well in ten days, but immediately after the operation it was found that he had lost his muscular sense in the right hand and arm below the elbow. All voluntary guidance of the hand was imperfect. When his eyes were closed he could not tell what position had been given to his fingers or hand, and he was un-

able to estimate the weight of substances with the right hand. But there was no loss of power, and his tactile sense and sensation of temperature and pain were normal. This condition began to pass off in about three weeks, and at the end of three months he had entirely recovered his muscular sense.

The exact position of the cortex injured was found to be about two inches behind the fissure of Rolando and about an inch and a half to the left of the median line, at about the junction of the superior and inferior parietal lobules.

The author concludes that this observation would indicate, first, that the muscular sense centres are distinct in their location from tactile or pain or temperature sense centres, and also from the motor centres; secondly, that they are situated just behind the motor area in the parietal region of the brain.

Insanity and Diseases of Women. (*Medical Record*, August 4, 1894.) By W. Gill Wylie, M.D.

The author reports three cases of reflex melancholia due apparently to genital disturbances and relieved by the cure of those conditions. In the first case, that of a woman thirty-five years of age, with hereditary tendency to mental disease, the removal of a large detached subserous fibroid that had already begun to undergo calcification seemed alone to produce a complete cure. Two other cases, one of subinvolution and one of lacerated cervix, recovered after relief of those conditions. The diagnosis of reflex melancholia, probably due to genital irritation, had been made by Dr. E. C. Spitzka in these two cases. Dr. Wylie advocates consultation with a gynecologist in cases where melancholia is unsuccessfully treated by open air, rest, and other means; where there is, as in many of these patients, a strong predisposition or an hereditary unstable brain, a guarded prognosis is advisable, even with apparent recovery.

An Epidemic of Paralysis in Children with a Report of One Hundred and Twenty Cases. (*Medical News*, December 8, 1894.) By Andrew MacPhail, M.D. (*Medical Record*, December 1, 1894.) By C. S. Caverly, M.D.

This remarkable epidemic occurred in Rutland County, in Southwestern Vermont, U.S.A. The first cases were observed late in June, 1894, the largest number in August, after which time the epidemic rapidly declined. The cases all occurred on the eastern slope of the Green Mountains, in an area fifteen miles long by twelve broad, and in the neighborhood of the city of Rutland, the summer having been dry and hot. Eighty-five cases were in children under six years, twenty-one were from six to fourteen years of age, and twenty were over fourteen, one case being in a person seventy years old. The paralysis was attributed to overheating in twenty-two cases, but was without apparent cause in eighty-nine. Thirteen proved fatal, twenty-five recovered, while thirty were improved and thirty-two unimproved at the time of the report. A child would usually

be suddenly seized with slight fever, delirium, perhaps constipation lasting for three days, then paralysis of an arm and leg or both legs would ensue, clearing up in perhaps two weeks or remaining at the end of three or four months. In twenty cases the left leg alone was paralyzed, in forty-five cases both legs alone, and in eight cases the left leg and left arm were affected. The muscles in every marked case showed the reaction of degeneration. It is the opinion of Dr. Caverly that some of these patients are permanently disabled. Of the thirteen that died, seven succumbed early in the acute stage, four had paraplegia, three paralysis of all extremities. There was no purpuric eruption and general absence of special sense disturbance. Unfortunately, no autopsies could be obtained. The features were those of poliomyelitis, and the epidemic is similar to those recorded by Cordier, Medius, and Putnam.

Pathology of Anterior Poliomyelitis. (*Medical Record*, December 1, 1894.)—Dr. M. Allen Starr shows that there is a tendency to revise the pathology of poliomyelitis and states that Goldscheider's recent conclusion, founded on a review of all the cases with autopsy, was that the disease began with a very intense congestion of the central arteries of the spinal cord, which come upon each side of the central canal and spread out in the central gray matter and into the anterior horns. These arteries have branches passing backward into the gray matter of the posterior horns, but the posterior horns are chiefly supplied with blood from the peripheral arteries, and hence are less affected when the inflammatory condition is limited to the distribution of these central arteries. After the engorgement of all the arterial twigs, diapedesis occurs and the surrounding nervous tissue is permeated by small cells and by serum. It is this choking of the gray matter by the inflammatory products which leads to the suspension of functional activity, and when, as in many cases from impoverished nutrition, the cells of the anterior horns are actually disintegrated by the inflammatory products, permanent destruction of the nerve-tissue ensues. Goldscheider believes, therefore, that the primary condition is a congestion in the domain of a definite set of arteries quite comparable to the condition occurring in the lung in a pneumonia and in the intestine in a typhoid fever. Siemerling has also written a very careful article on the "Pathology of Infantile Paralysis" in the *Archiv für Psychiatrie* for January, 1894. His conclusion is as follows: "After a careful review of all the literature, we reach, therefore, the following conclusion, that in the pathogenesis of infantile spinal paralysis the inflammatory lesion of the interstitial tissue in connection with a distention of the blood-vessels, especially in the region of the anterior spinal arteries, plays the chief rôle. A primary inflammation of the ganglion cells, in the sense given by Charcot, is not to be admitted."

OPHTHALMOLOGY.

IN CHARGE OF CHARLES A. OLIVER, A.M., M.D.,
Philadelphia, Pennsylvania,

AND

EDMUND LANDOLT, M.D.,
Paris, France.

Eye-Diseases in Chinanfu, China. (Personal communication to Dr. Oliver.) By James B. Neal, M.D.

The new cases of eye-disease treated in two out-patient dispensaries and in the hospital during the six months beginning January 1, 1894, numbered four hundred and thirty-one. The total number of new patients was three thousand six hundred and forty; therefore one-eighth of all the cases in a good-sized general practice were of an ophthalmological nature.

The writer says that eye-diseases are very common in Chinanfu. "The various forms of conjunctivitis lead in point of numbers, the granular form being very prevalent and frightful in its ravages. It is responsible for more dimness of vision, if not actual blindness, than any other disease found in this part of China. As a consequence, the cases of entropium are numerous and often very severe, while the various grades of trichiasis and ulceration of the cornea are of constant occurrence. Corneal opacities and pannus follow in the train of the granular ophthalmia." Purulent conjunctivitis is very rare, considering the prevalence of gonorrhœa; but iritis, especially old, chronic cases, stands out in bold relief. Many patients are deprived of useful eyesight by neglect of an acute attack of iritis. Seven operations for pterygium, and the same number for entropium and trichiasis, were performed. Pterygia are very large, frequently appearing upon both eyes at once. Occasionally they develop two on one eye, which spread over the pupil until they meet.

New Eye Cases seen at Chinanfu, China, January 1 to June 30, 1894.

Blepharitis	4	Lacrymation	7
Conjunctiva, hyperæmia of	11	Pterygium	19
Conjunctivitis	108	Staphyloma	2
“ phlyctenular	14	Symblepharon	1
“ granular	44	Trichiasis	24
“ purulent	2	Unclassified	25
Cataract	11		
Corneal ulcers	41	Total	431
“ opacities and pannus	34		
“ inflammation	28		
Choroiditis	1		
Ectropium	4		
Entropium	15	<i>Operations included in above.</i>	
Glaucoma	4	Entropium	6
Intertrigo of lids	11	Pterygium	7
Iritis	21	Symblepharon	1
		Trichiasis	1

Recent Experiences in the Treatment of Detached Retina, with a Detailed Report of Thirty-Eight Cases. (*Transactions of the American Ophthalmological Society*, 1894.)

As the result of the trial of various methods of treatment in this affection, C. S. Bull, of New York, feels justified in coming to the following conclusions :

1. The science and practice of ophthalmology have as yet discovered no better means for dealing with detachment of the retina than the old methods which have been advised and carried out for so many years,—viz., rest on the back in bed, atropine, a bandage, and the internal administration of some drug which may induce absorption of the subretinal fluid.

2. The continued use of pilocarpine, either hypodermically or by the mouth, may cause great prostration, even in cases in which it is apparently well borne; and the desired effect may sometimes be produced by small doses of bicarbonate of sodium and iodide of potassium, largely diluted with water.

3. In all recent cases puncture of the sclera subconjunctivally may do good temporarily by letting out the subretinal fluid and allowing the retina to collapse, thus producing some improvement in the vision; but the apparent improvement is generally transient, and when membranous bands exist in the vitreous, no improvement can be expected from simple puncture.

4. Division of fixed membranous opacities in the vitreous causes but little reaction, and may do positive good even without division of the detached retina, as it reduces the danger of extension of the detachment. It is positively contraindicated in cases where the vitreous opacity is vascularized, as it would certainly induce free hemorrhage into the vitreous. It should never be done in an irritated or inflamed eye.

5. Division of the detached retina, which allows the subretinal fluid to escape into the vitreous chamber, may always be done in a quiet eye, and causes little or no reaction. If membranous bands are present in the vitreous, these should also be divided at the same time.

6. In most cases, all these operative procedures produce but temporary improvement, and in many cases no effect whatever is gained by them.

7. There seems no good reason for further endorsement of the method advocated by Schöler, but every reason for rejecting it from the domain of ophthalmic surgery.

Foreign Body in the Ciliary Region of an Eye for Seven Years without the Appearance of Symptoms of Sympathetic Irritation. (*Corps étranger de l'œil ayant séjourné pendant sept ans dans la région ciliaire sans entraîner de phénomènes sympathiques. Annales de la Polyclinique*, November, 1894.)

This case, seen by Lagrange, of Bordeaux, occurred in a sculptor, who seven years previously had been struck in the ciliary region of the left eye,

with a piece of bronze. The patient, a forty-five year old man, applied for a lens to correct some optical defect in the right eye, which, according to the author, had no bearing upon the traumatism. The injured organ, which was blind, showed the presence of nearly complete occlusion of the pupil. Upon opening the globe, total detachment of the retina was at once noticed, and an irregular ovoid piece of bronze was found encysted in a fibrous nodule, which was situated in the cicatrix of entrance.

Two Recent Magnet Operations ; One an Ideal Success, the other a Total Failure : With Remarks. (*Transactions of the American Ophthalmological Society*, 1894.) By Dr. Herman Knapp, of New York City.

After a description of two most interesting cases of these types, Knapp recommends the two following modifications in the method of operative procedure.

1. *Make the incision obliquely through the sclerotic*, because such a wound after the operation is firmly closed by the vitreous pressing the sharp inner lip of the inner side of the wound against the outer lip, thus favoring rapid union, preventing presentation and escape of vitreous, with their consequences, of which the later development of fan-like cords in the vitreous, starting from the scar, is particularly prejudicial to the preservation of good sight.

2. *During the introduction and withdrawal of the magnet, keep the wound open with a sterilized platinum wire, or a similar instrument.* In this way, the foreign body will not be easily stripped off from the lips of the wound.

OBSTETRICS AND GYNÆCOLOGY.

IN CHARGE OF RICHARD C. NORRIS, M.D.,

Lecturer on Clinical and Operative Obstetrics in the University of Pennsylvania ; Physician-in-Charge, Preston Retreat ; Visiting Obstetrician, Philadelphia Hospital ; Gynæcologist, Methodist Episcopal Hospital ; Consulting Obstetrician and Attending Gynæcologist, South-eastern Dispensary and Hospital for Women and Children.

Suture of the Torn Cervix Uteri Immediately after Labor. (*New York Medical Journal*, January 19, 1895.) By William R. Pryor, M.D., of New York City.

Severe and alarming hemorrhage from the torn cervix requires suture or ligature *en masse*. An operation to check bleeding from the uterine artery or its branches should not be called trachelorrhaphy. Lacerations of the cervix are not accountable for post-partum hemorrhage, nor are they accountable for subinvolution. The liability of an open, torn cervix to become infected is a question difficult of solution. If the confinement has been surgically a clean one, infection cannot occur. If the accouchement has been filthy, we have no right to lock up in the uterus the lochial discharge. The torn cervixes of Dübosser's incisions do not become infected.

An examination of frozen sections of post-partum cases fails to show such separation of torn cervical lips as those who advocate trachelorrhaphy picture. It is difficult to tell how much of the tissue will be cervix, when involution is complete, and how much lower uterine segment or vagina; since the anatomical relations of the parts are so disturbed by the merging of the uterine and vaginal canals into one parturient tract. It is the author's belief that there is but one indication for immediate repair for the torn cervix,—hemorrhage. To do trachelorrhaphy in all cases, where even marked separation of the cervical lips appears to exist, is to introduce into obstetrics one more interfering, meddlesome, routine operation for which there is absolutely no reason; is to add more chance for infection; and is to undo what nature, at great pains and beneficently, has accomplished,—viz., a provision for the free escape of the lochia. The large everted flaps of cervical tissue which we see some months after labor are not natural; but the abnormality existed before conception, has been increased by pregnancy, and demands only the operation which should have been done before conception.

A Point in the Examination of the Pelvis in Stout Women. (*The Philadelphia Polyclinic*, December 1, 1894.) By Harris A. Slocum, M.D., of Philadelphia.

One of the difficulties met with in the examination of the pelvis in very stout women is overcome by selecting for external manipulation that portion of the abdominal wall in which the adipose tissue has been lessened. This region the author describes as lying beneath a depressed curved line, a groove in very stout people, running from one anterior iliac spine to the other, with its convexity toward the mons veneris, and generally just touching the upper border of the growth of hair. At this groove and for half an inch above it the fat will be found to be least in amount.

Does Castration act as a Curative Factor in Osteomalacia? (*Zeitschrift für Geburtshülfe und Gynäkologie*, 1894, vol. xxxi., No. 1.) By Professor Ludwig Kleinwächter, of Czernowitz, Austria-Hungary.

In a severe case of endemic osteomalacia, Kleinwächter has seen a complete cure occur after a Cæsarean section, the ovaries not being removed. The patient, a thirty-seven-year-old Jewess, was the mother of eight children, and showed all of the skeleton to be diseased with the exception of the bones of the head. As she was six months pregnant, the producing of premature labor was advised, but refused. The woman was then lost sight of for several years, when a telegram was received, asking for the performance of an immediate Cæsarean section, as she had again become pregnant. She informed the physician that her former labor had been very difficult, and since then her pains had been all the more severe. The bag of water had ruptured the day previously. The body was now still more deformed, her height having diminished five centimetres. At the examination the finger could

barely be admitted into the vagina. It was thought, however, that the placenta was adherent, and the head pressing upon it. An immediate Cæsarean section was performed. After removing a living child, forty-seven centimetres long, the uterus was washed with a warm creolin solution and sprinkled with iodoform. The uterus contracting well, the opening was closed by stitches not penetrating through the muscle, additional superficial stitches of sublimated silk being next employed. Kleinwächter intended to remove the ovaries for the sake of the supposed curative action on the osteomalacia, but did not do so on account of his being physically exhausted at the time of the operation. Recovery was attended with no fever, but was complicated by vomiting and a severe cough. Five months later the woman was in a much better condition than formerly, and after a year she claimed that she was practically well, which was confirmed several years later on by a personal examination, when her physical condition was found to be perfectly satisfactory.

In another case of osteomalacia, where the ovaries were removed at the Cæsarean section, the woman died five days after the removal of a decomposed foetus.

The writer remarks how easy it would have been if the ovaries had been excised in the first case to have supposed that the cure had been accomplished through their removal.

DERMATOLOGY.

IN CHARGE OF W. A. HARDAWAY, A.M., M.D.,

Professor of Skin-Diseases in the Missouri Medical College, St. Louis.

ASSISTED BY

C. F. HERSMAN, A.M., M.D.,

St. Louis.

The Protozoa-Like Bodies of Herpes Zoster.—Hartzell (*Journal of Cutaneous and Genito-Urinary Diseases*, September, 1894) describes certain bodies occurring in the vesicles of herpes zoster which have been regarded as protozoa. These occur in three forms. The first variety consists of a double-contoured wall with one or two nuclei in the centre. Such cells often occur in pairs. The second variety is less numerous than the first. The cells are very large, three or four times the diameter of epithelial cells. They consist of a cell body surrounding a thick internal wall which encloses a cavity containing from three to a dozen or more round or oval cells. With a high power the small cells in the cavity are found to contain nuclei which stain rose-red with Biondi's fluid. The bodies of the third variety are very large and pear-shaped, with the same general arrangement as those just described. They resemble the epithelial cells containing coc-

cidia found in the bile-ducts of rabbits suffering from psorospermiosis of the liver. The author then narrates a case of recurrent zoster in the course of the sciatic nerve, which was of traumatic origin. In the vesicles in this case the bodies described were found, and from the fact that they occurred in this traumatic case the author concludes that these cells are not coccidia, but altered epithelial cells.

The Present Position of the Question of the Vegetable Hair Parasites.—At the sixty-second annual meeting of the British Medical Association Dr. Leslie Roberts read a paper dealing with the question of the species of hair fungi which it is possible to recognize at present. The author criticises the conclusions of Sabouraud as being too sweeping and resting on insufficient grounds. Sabouraud founds his different species upon observing (1) the clinical features of the disease caused by the fungus, (2) the form and position of the parasite in the hair or scale, (3) the external appearance of the cultivated vegetation.

Dr. Roberts characterizes Sabouraud's statement, that if we rear trichophytons in the same soil, naked-eye differences as to form and color are sufficient to differentiate various species, as unscientific. The author then related how he caused two cultures of the fungus, of identical origin and growing on the same soil, to take on entirely different naked-eye appearances by merely changing the temperature under which the growths occurred. Dr. Roberts then shows that the position of the fungus in the hair is not a constant quantity, for he has been able to cause a fungus which was situated wholly within a hair to grow upon the outside of and around a hair. Also, the clinical picture of ringworm may vary with the same fungus, as the author makes plain by a comparison of the clinical features observed with trichophyton megalosporon in Paris and in Liverpool.

PATHOLOGY.

IN CHARGE OF ALLEN J. SMITH, A.M., M.D.,

Professor of Pathology in the Medical Department of the University of Texas, Galveston, Texas,

AND

HENRY W. CATTELL, A.M., M.D.,

Demonstrator of Morbid Anatomy in the University of Pennsylvania; Prosector to the American Anthropometric Society; and Pathologist to the Presbyterian Hospital, the Institution for Feeble-Minded Children at Elwyn, etc.

Flagellate Protozoa in the Freshly-Passed Urine of Man. (*Medical News*, December 22, 1894.) By George Dock, M.D., of Ann Arbor, Michigan.

In a male patient, aged twenty-seven, formerly living in Texas, and suffering while there from malarial hæmaturia, Dock has found an organism very closely resembling, if not identical with, the *trichomonas vaginalis*. The

man, whose veracity there is no reason for doubting, denies coitus. Only three cases, those of Küntsler, Marchand, and Miura, are said to have been thus far described in the freshly-passed urine of the male.

The Effects of Sunlight on Tetanus Cultures. (*Jour. of Path. and Bact.*, November, 1894.) By F. F. Wesbrook, M.D., of Cambridge, England.

The results of the author's experiments in this line of research confirm very strongly the conclusions arrived at by Downes and Blunt, Duclaux, Roux, and others, that oxygen is a necessary factor in the destruction of bacteria by light. Not only is this so, but an actual diminution of the contained air was shown to take place during the time of exposure of cultures in air. Whatever the process consists in, the larger the surface exposed the more rapid is the destruction when equal volumes are exposed. At present we have not sufficient data to say exactly what this process is, any more than to enable us to know that in the absence of oxygen the sun is powerless to produce any harmful effect on the bacteria exposed to it.

Tetanus cultures are completely killed on prolonged exposure to the sun in air, though it is possible to stop at a point where the pathogenesis vanishes, while life still remains in the spores.

From the limited number of observations, it would appear as if those spores which survive the sun's action are capable of producing on reinoculation into fresh tubes not only quite as virulent cultures as before, but the pathogenesis seems to be increased. It is also very evident that it is possible to inject into mice living tetanus spores without producing symptoms of any kind. Whether this is due to the smallness of the dose, to a temporary attenuation, or to the fact that in the absence of the poison tetanus spores are harmless is a question which at the present must remain unanswered, but must be left until further research throws more light upon it.

A Contribution to the Study of the Toxins of Cholera. (*Annales de l'Institut Pasteur*, 1894). By F. F. Wesbrook, M.D., of Cambridge, England.

The author's researches show that the substances withdrawn from different culture media of the cholera vibriion do not have the same chemical constitution, as far as can be ascertained, and yet have a certain uniform physiological action; thus, (1) from cultures in alkali albumen can be found: (a) a deuterio-albumose, (b) traces of proto-albumose, (c) a variable quantity of proteid material (probably an alkali-albumen). (2) From cultures on eggs: a mixture of proteid material impossible to separate. (3) From peritoneal exudate: a substance which, although it gives a slight xanthoproteic reaction, does not apparently contain either deuterio-albumose or proto-albumose. (4) From cultures in the aparaginate of sodium: a substance which gives a feeble xanthoproteic action, but not the biuret reaction.

These substances resemble each other in their physiological properties and

action, while differing in their chemical nature. They produce mortal effects in large doses, or in small doses give a marked immunity against living cultures.

Thus we have found substances which we can affirm, even with our imperfect methods, belong to the peptones without albumoses, and give the same effect physiologically as toxins isolated from the peritoneal fluid of guinea-pigs killed by the inoculation of cholera; toxins which do not contain an appreciable quantity of either peptones or albumoses.

In the case of cultures upon alkali-albumens, the immunity produced by the precipitate derived from their neutralization is as marked as that from the proto- and deutero-albumoses.

From this we must conclude that the vibriion of cholera gives different chemical products when cultivated on different media, which, *a priori*, is extremely improbable, or that its toxin is a constant substance uniformly associated with the proteid materials contained in the culture media or produced during the cultivation.

It would seem probable that a toxin is more pure when cultivated in a substance from which proteid substances have been removed. At least, it is very remarkable that in such a medium the toxin is almost entirely deprived of all appreciable proteid substance, and gives none of those reactions which permit it to be classed among the albumoses, peptones, globulins, or alkaloids.

MISCELLANEOUS.

Glycerin Intoxication after the Injection of Emulsions of Glycerin and Iodoform. (*Arch. für klin. Chir.*, vol. xlix., No. 1, 1894.) By Leopold Schellenberg, M.D., of Breslau.

The author arrives at the following practical conclusions from his studies :

1. The harm produced by glycerin intoxication increases with the amount of glycerin injected, the absorptive power of the tissues, and the pressure under which the fluid was injected.

2. A dose of ten cubic centimetres in children and of twenty to twenty-five cubic centimetres in adults will apparently be absorbed without any harmful results.

3. It therefore follows that in parenchymatous injections intoxication phenomena will not be easily produced, except the slight and transient phenomena.

4. The intact abscess wall of cold abscesses absorbs so slowly that in these cases three or four times the ordinary amount may be injected without danger.

5. Especial care should be taken in extensive fresh wounds and the cavities of large joints.

He believes some other media of suspension should be employed, though some surgeons prefer to have the reaction produced by the glycerin.

An Addition to our Knowledge Concerning the Length of the Intestines. (*Deut. Zeit. für Chir.*, vol. xl., No. 102, 1894.) By Paul Dreike, M.D.

This author made his measurements in a systematic manner, following the line of junction with the mesentery and studying the length of the intestine, in relation to age, sex, and pathological changes. The examination was made of one hundred and sixty-nine bodies, with the following results:

1. In children, sex had no influence on the length of the intestines, but in adults the intestine was relatively longer in men than in women.
2. Children have a relatively longer intestine than adults.
3. The large intestine is relatively longer in adults than in children, when compared with the small intestine.
4. Pathological changes produce in children a marked lengthening of the intestine.
5. Individuals who have died from phthisis and marasmatic diseases have a shorter intestine.

Autopsy on the Late Czar of Russia, Alexander III. (*Provincial Medical Journal*, January 1, 1895.)

There was considerable œdema of the subcutaneous tissue of the legs, with reddish patches on the left knee. The cavity of the left pleura contained two hundred cubic centimetres of serous fluid, stained red. In the cavity of the right pleura there were fifty cubic centimetres of a similar fluid. The apex of the right lung bears the mark of an old fibrous cicatrix. The left lung is slightly œdematous, and there is hemorrhagic infarction in the inferior lobe, which is very full of blood, and contains extremely little air. The hemorrhagic infarction is situated on the upper border of the inferior lobe of the left lung, and presents on section a triangular form, a centimetre and a half long by one centimetre wide. The cavity of the pericardium contained thirty cubic centimetres of serous fluid, stained red. The volume of the heart is considerably augmented. Its vertical diameter is seventeen centimetres, and its horizontal diameter eighteen centimetres. The subserous tissue contains a large quantity of fatty tissue (*lipomatosis cordis*). The heart is in a state of slight diastole. The left cavity is enlarged, and the wall of the left ventricle is thickened (the thickness is equal to two and a half centimetres). The muscular substance of the left ventricle is pale, flabby, and yellow tinted (*degenera adiposa myocordii*). In the right ventricle the muscular wall is thinned (six millimetres), and has the same yellow tint. The valvular apparatus is in a perfectly normal condition. The abdominal cavity contained about two hundred cubic centimetres of serous fluid. The stomach and the intestines contained a large amount of gas. The volume of the liver is slightly increased, and this

organ is very plethoric. The dimensions of the kidneys are as follows: Left, sixteen centimetres long, seven centimetres wide, and four centimetres thick; right, fifteen centimetres long, six and a half centimetres wide, and four centimetres thick. The capsule of the kidney is of normal thickness, and is easily detached. The surface of the kidneys is slightly granular, and deeply red in color. The density of the kidneys is insignificant. The cortical substance of the kidneys is diminished (from six to seven millimetres), and has a yellowish tint; the medullary substance is of a deeply red color (*nephritis interstitialis cum atrophia substantiva corticalis renum granulosa*). Moreover, a serous cyst, three millimetres in diameter, was found in the left kidney.

In virtue of the preceding, we formulate the opinion that H. M. the Emperor Alexander Alexandrovitch succumbed to cardiac paralysis, preceded by degeneration of the muscular substance of the hypertrophied heart, and by interstitial nephritis (granular atrophy of the kidneys).

Signed: Drs. Klein, Zernof, Popof, Béloousof, Altoukhov.

The Card-Index or Card-Catalogue as adapted to History-Taking in Private Practice. (*New York Medical Record*, December 29, 1894.) By Robert L. Dickinson, M.D., of Brooklyn.

The author recommends taking the histories and notes of cases on ruled cards of uniform size, which stand on end in a drawer, and which are to be indexed alphabetically. The cards used are six by six and two-third inches, blue-ruled, with red head-line. If the amount of writing be considerable the cards may be fastened together by a Middleton clip. In case bedside or operating-table notes are to be made the cards may be folded and carried in the pocket. The advantages claimed for the system are: the portability of the cards; the elasticity of the system, all data of one case being capable of being grouped together and the possibility of adding more notes to one case or more histories to the whole number; ease of indexing; and facility of reference to any case. These advantages are not to be had if books are used for keeping records. The outfit, consisting of one thousand cards and an alphabet index with box or drawer, would cost, at most, nine dollars.

J. M. S.

An Inquiry into the Relative Efficiency of Water-Filters in the Prevention of Infective Disease. (*British Medical Journal*, December 29, 1894.) By G. Sims Woodhead, M.D., and G. E. Cartwright Wood, M.D.

After examining the filters placed on the market by twenty-one manufacturers for use as table filters, the authors have had to report unfavorably on almost all of them. The filters of eighteen firms were found in the experiments to afford no protection against the communication of water-borne disease. A great many different forms of carbon blocks were tested, and it is highly improbable that this medium will ever furnish a reliable

filter. Filtering media of stone, iron-oxide, and nibestos have also proved ineffective, although it is possible that the latter material may in the future be successfully adapted to this purpose. Porcelain, unless specially prepared, is not reliable as a filter medium. A great many of the filters are used by the purchaser not so much to prevent disease as to render the water clear and palatable. As a purely mechanical filter the nibestos filter seems to function admirably, and since its filtering medium is purely mineral and can be easily and cheaply renewed when its surface becomes covered with the impurities extracted from the water, the dangers attending the use of an imperfect filter are reduced to a minimum. It is very difficult to determine which of the charcoal filters are to be recommended, since this medium forms such a favorable breeding-ground for many micro-organisms. The Wittman charcoal vase-filter presents certain advantages over others, since it has no fittings which can go wrong, as it can be easily cleaned and sterilized. The Pasteur-Chamberland, Berkefeld, and Porcelaine d'Amiante filters appeared in the experiments to afford protection from water-borne disease. In these filters, however, the rate of filtration is slow unless a number of "candles" are used to form what is technically known as a battery. When these are made use of, the number of candles employed and the number of connections required multiply the risk incurred from either an imperfect candle or from one of the fittings going wrong, which in either case would frustrate the whole object of filtration. Such filters should always be used as tap or pressure filters, because (1) it is essential that a sufficient supply of filtered water should be available to subserve all domestic purposes; (2) this should be effected with as little trouble as possible, otherwise the filtering may be neglected.

The method employed in testing these filters was as follows: The filters were put to work on water holding certain known test organisms, staphylococcus pyogenes aureus and yeast plants, and allowed to run for four days. Then they were put to work on pathogenic organisms, (1) cholera bacilli and (2) typhoid bacilli, and allowed to run for four days filtering water containing these organisms. The filters were also tested by filtering tap-water for four days. In each case the number of organisms per cubic centimetre of water to be filtered was ascertained and the number of organisms per cubic centimetre in the filtrate at the end of each day. It was found that water organisms would grow through the filter in from two to four days. The Pasteur-Chamberland and the Porcelaine d'Amiante filters were exceptions to this rule, no water organisms appearing in the filtrate even after four days' work.

Modern Development of Harvey's Work. (Provincial Medical Journal, November 1, 1894.) By T. Lauder Brunton, M.D., F.R.S.

One is apt to overlook the enormous extent to which Harvey's work now influences the thoughts and actions of the medical profession. Out of his idea, that there might perhaps be motion in a circle, has grown our

knowledge of the processes of human life, in health and in disease, of the signs and symptoms which indicate disease, of the mode of action of the drugs and appliances which we use, and of the proper means of employing them in the cure of disease. To the discovery of the circulation of the blood can be traced all that we now know concerning the cycle of action of the heart and concerning the heart-sounds. The knowledge thus obtained aids us in the diagnosis, prevention, cure, or control of cardiac disease. As a result of this knowledge we have the studies which led to the practical application of subcutaneous medication and of the transfusion of blood. After the demonstration of the circulation, Ludwig, continuing the investigations, enabled the blood pressure in the arteries to record its own variations and worked out the plan of artificial circulation by which changes in the function of certain organs could be noted. Volkmann applied the graphic method of Ludwig to the registration of the pulse in man. Studies by the Webers and others have demonstrated the control of the pneumogastric and sympathetic nerves over the heart, the fact that the cardiac muscle will pulsate automatically when removed from the control of these nerves, and the like mechanism connected with the blood-vessels. It has been proved that the vessels supplying the muscles are not controlled by the vaso-motor centres in the medulla in the same way as are the vessels of the intestines and skin. This knowledge enables us to understand the pathology of angina pectoris, the treatment of angina pectoris, and other cardiac affections, the method of eliminating dropsies, and the application of massage, passive movements, and graduated active movements to the treatment of cardiac disease. The use of ferments derived from solid organs can be traced back to the employment of raw meat in the treatment of diabetes in Harvey's own hospital. Following on this has come the treatment of certain diseases by antitoxins.

Dietaries and Food-Supplies for State Hospitals. (Circular issued by the New York State Commission in Lunacy.) By Austin Flint, M.D., of New York City.

The following revised schedule of a daily ration for each insane patient has been prepared by Flint.

	Ounces.
Meat, with bone, including salted meats, fresh and salted fish, and poultry.....	12
Flour, to be used in making bread and in cooking (may in part be substituted by corn meal and macaroni).....	12
Potatoes.....	12
Milk.....	16
One egg.....	2
Sugar.....	2
Butter.....	2
Cheese.....	1
Rice, hominy or oatmeal.....	1½
Beans or peas (dried).....	1½
Coffee (in the berry and roasted).....	$\frac{5}{8}$
Tea (black)	$\frac{1}{8}$

In buying beef, it is recommended that, with each whole carcass purchased, there be bought one fore quarter additional. This gives an extra quantity for soups and stews and provides additional roasting pieces for the officers' table. The clear meat of the parts that have been used in making soups may be served "braized," or otherwise prepared, from time to time. Though not so nutritious as when made of fresh meat, dishes prepared in this way may easily be made palatable, and would agreeably vary the diet, if not used too frequently. In the purchase of mutton, veal, pork, etc., it is recommended, as a matter of true economy as well as contributing to the proper quality of supplies, to buy whole carcasses, not the inferior parts only, which latter usually contain a large proportion of bone. With the different classes of persons to be provided for—physicians, attendants, workers and non-workers, male and female—nearly every part of an animal can be profitably and economically used. In the purchase of certain other articles, such as coffee and tea, impurities or adulterations, even if not positively harmful, take away from nutritive efficiency and are not in the line of true economy. Flour, milk, eggs, cheese, potatoes, beans, etc., take the place, to a certain extent, of other articles which are more costly. It requires but little experience to learn that the waste of flour, milk, etc., of poor quality, involves more expense than the purchase of first-class articles.

Some parts of a bullock contain only eight per cent. of bone; some parts contain fifty per cent. Payen estimates that ordinary supplies of meat contain twenty per cent. of bone. The meat includes a considerable but variable quantity of fat. Veal should never be supplied unless it is of the best quality. The same remark applies to fresh pork. A calf, when dressed, should weigh about one hundred and thirty pounds. A young hog, when dressed, should weigh one hundred and twenty to one hundred and forty pounds. A dressed sheep should weigh sixty-five to one hundred and twenty pounds. A dressed steer should weigh six hundred and fifty to nine hundred pounds, the fore quarter weighing one hundred and ninety to two hundred and fifty pounds, and the hind quarter, one hundred and forty to two hundred pounds. One of the great advantages of skilful cooking is that inferior parts of carcasses may be utilized in the making of nutritious soups, stews, etc., which will take the place, to a great extent, of more costly articles and give more satisfaction to patients. Vegetable soups, also, may be largely used with advantage.

One hundred pounds of flour will make one hundred and thirty-six pounds of good bread. Corn meal may be substituted for flour, but to a limited extent, as it is less nutritious and often disturbs digestion. Macaroni may be substituted for flour, but only as an occasional luxury. Bread should be made every day, and what is left over should be used in cooking and not be served again. If bread is made during the night and the baking finished as early as 3 A.M., it may be served the same day. If to be served the next day, it should be baked as late as practicable in the afternoon or

evening. If bread is simply warmed through in the oven immediately before serving, the moisture absorbed by the gluten is driven off, and the bread is much more palatable and digestible; but bread should never be dried in this way more than once.

The use of fresh vegetables in season will permit a suspension or reduction of the rations of rice, beans, and peas, with some reduction in the ration of potatoes. Fresh vegetables and fruits should be used freely. Onions should be used in cooking and should be served occasionally as a separate dish. Flint has long observed that onions are craved by inmates of hospitals. Turnips, parsnips, salsify, carrots, and beets may not strictly be classed as fresh vegetables, but they may be frequently used with advantage.

Coffee can be better and more uniformly roasted in large quantities and by experts than in a hospital; by roasting it loses about sixteen per cent. in weight. The coffee should be very finely ground before making the infusion. The ration does not include condiments and other flavoring articles, syrup, molasses, preserves, and compotes, such as apple sauce, apple butter, etc., which should be provided as occasion offers. If men and women are supplied at separate tables, it will be convenient to make up the supplies for each from this daily ration. Five per cent. may be added for men and deducted for women, making a difference of ten per cent. For workers, an addition of twenty-five per cent. may be made to the rations of meat, flour, and potatoes. Eggs are made interchangeable with milk; cheese with butter.

Recommendation, by President Cleveland, of a National Board of Health.

Writes President Cleveland in his annual message to the present Congress,—

“I am entirely convinced that we ought not to be longer without a national board of health or national health officer, charged with no other duties than such as pertain to the protection of our country from the invasion of pestilence and disease. This would involve the establishment by such board or officer of proper quarantine precautions, of the necessary aid and counsel to local authorities on the subject; prompt advice and assistance to local boards of health and health officers in the suppression of contagious disease, and in cases where there are no such local boards or officers, the immediate direction by the national board or officer of measures of suppression; constant and authentic information concerning the health of foreign countries and all parts of our own country as related to contagious diseases, and consideration of regulations to be enforced in foreign ports to prevent the introduction of contagion into our cities and the measures which should be adopted to secure their enforcement. There seems to be at this time a decided inclination to discuss measures of protection against contagious diseases in international conference with a view of adopting means of

mutual assistance. The creation of such a national health establishment would greatly aid our standing in such conferences and improve our opportunities to avail ourselves of their benefits.

“I earnestly recommend the inauguration of a national board of health or similar instrumentality, believing the same to be a needed precaution against contagious diseases and in the interest of the safety and health of our people.”

FORENSIC MEDICINE.

IN CHARGE OF LORENZO D. BULETTE,
Of the Philadelphia Bar.

REFUSAL OF DRUGGIST TO COMPOUND A PHYSICIAN'S PRESCRIPTION NOT ACTIONABLE AS BEING SLAN- DEROUS.

MAY a druggist refuse to compound a prescription sent him by a physician? If so, to what extent and under what circumstances does the law excuse him for so declining? And how far may such bare refusal, without comment thereon at the time by the druggist, inasmuch as it tends to create an unfavorable impression in the mind of the applicant as to the physician's competency, be accounted slanderous, so as to give rise to a cause of action?

The answer to these questions was given, and the law defining the duty of the apothecary, under circumstances such as here suggested, was laid down by the Supreme Court of Louisiana in a recent case.¹

An action for damages was brought by the plaintiff, a physician, against the defendant, a druggist, because of the latter's refusal to compound his prescriptions, and also for slander. The defence interposed by the druggist was his inability to fill the prescriptions, and a denial of the slander.

The testimony introduced at the trial shows that the druggist had declined to fill two prescriptions of the plaintiff because, in the case of the first prescription, a patent medicine was one of the ingredients; and the defendant, as he himself testified, was averse to putting up prescriptions containing this patent medicine, since he was not sure of its composition, and was, for that reason, unwilling to assume the responsibility of such a prescription.

There was testimony, on the one hand, that it is not usual to make a patent medicine a component of a prescription; but there was also testimony

¹ *Tarleton vs. Lagarde*, 16 So. Rep. 180 (1894).

tending to show that such a course is not infrequent. And the Supreme Court were of the opinion that this difference in the testimony of the physicians, who so testified, deserved some consideration when taken in connection with the druggist's unwillingness to prepare the prescription.

As to the second prescription, counsel for the plaintiff argued that the defendant should be held liable because of his refusal to compound avowed in his answer, which is that the prescription was not filled because he did not have the necessary ingredients, and for other causes.

A verdict of fifty dollars was given for the plaintiff in the court below. From the judgment entered thereon the defendant appealed to the Supreme Court; and the plaintiff, in answering this appeal, asked that the award be increased.

The theory of the plaintiff's case is based on the general proposition of law that a druggist is liable in damages for his refusal to fill prescriptions. "We cannot," says the Supreme Court, "assent to this view. In many cases the druggist may have the best reason for declining. As a chemist, he may perceive, or have cause to suspect, that the physician erred in his prescription. Or the druggist may not have at hand the ingredients, or he may distrust his ability to prepare the prescription, or other causes may disincline the druggist to undertake filling prescriptions. Recognizing the room for all such causes, we cannot hold that the mere refusal of a druggist to fill prescriptions furnishes any occasion to hold him for damages to the physician who gives the prescription. It does not appear from the testimony that, on a refusal to fill the prescriptions, the defendant used any language derogatory to the plaintiff. True, the father of the child for whom one of the prescriptions was given states that the impression, as to the plaintiff's professional capacity, made on his mind by defendant declining to fill the prescription was unfavorable. But it is quite certain no such impression could be derived from anything the plaintiff said, and an impression arising solely from the exercise of the defendant's right to decline to fill the prescription obviously furnishes no cause of action for the physician against the druggist."

The slander attributed to the defendant, which was the second element constituting the cause of action in this case, arose in the course of a discussion between himself and one of his fellow-citizens, begun on the street and continued in a barber-shop. It commenced with a request of defendant for information of the gentleman addressed, formerly a representative in the legislature from defendant's parish, whether the laws compelled a druggist to fill prescriptions presented to him. The information given on that subject did not suit defendant, but seems to have excited him, and led him to make observations offensive and unjust to the plaintiff, at least in their tendency to affect those who were gathered around by the animated and angry discussion, or to whom the observation might be repeated. Says the Supreme Court: "The defendant, exercising his privilege of declining to fill plaintiff's prescriptions, should for that very reason have abstained from any comments calculated to convey impressions damaging to plaintiff's

character as a professional man. On the contrary, defendant engages in a public discussion on the subject of plaintiff's prescriptions, in which he derided the plaintiff's diploma, saying that he (the defendant) would not give a straw for such a diploma; and he further commented on one of plaintiff's prescriptions as containing ingredients that might kill the child. It is in proof that the plaintiff is a graduate of the medical department of T. University, and that he is a practising physician. There is no testimony to justify the defendant's comments on plaintiff's prescription, and there is, if possible, still less extenuation for defendant's disparaging allusions to plaintiff's diploma. The application of the defendant's remarks was well understood. They were uttered publicly. Their natural tendency to affect plaintiff injuriously as a professional man is obvious, and the mischief apt to be done by such language is increased when it is considered that defendant is a druggist in the community in which plaintiff is a practising physician. We have read with care the elaborate opinion of the judge of the lower court. We think that, under the circumstances, the judgment should be more than nominal. The case is an assault without semblance of cause on professional reputation. In our opinion the judgment should be increased to one hundred dollars, with costs of both courts."

BOOK REVIEWS.

SYLLABUS OF LECTURES ON HUMAN EMBRYOLOGY. An Introduction to the Study of Obstetrics and Gynæcology. For Medical Students and Practitioners. With a Glossary of Embryological Terms. By William Porter Manton, M.D., Professor of Clinical Gynæcology and Lecturer on Obstetrics in the Detroit College of Medicine. Pp. 125. Philadelphia: The F. A. Davis Company; London: F. J. Rebman, 1894.

This syllabus claims to furnish an outline of the principal facts in human embryology, and there is but a bare outline of these facts given. A student or practitioner who would expect to find in the volume that which would assist him in understanding the facts about embryology would be greatly disappointed. Of the one hundred and twenty-five pages supposed to be devoted to embryology, twenty-four are taken up by a meagre description of the anatomy of the female organs of generation.

J. M. S.

A MANUAL OF MODERN SURGERY: GENERAL AND OPERATIVE. By John Chalmers Da Costa, M.D., Demonstrator of Surgery, Jefferson Medical College, Philadelphia; Chief Assistant Surgeon, Jefferson Medical College Hospital, etc. With 188 illustrations in the text and 13 full-page plates in colors and tints. Pp. 809. Price, \$2.50. Philadelphia: W. B. Saunders, 1894. (Saunders's New Aid Series.)

The object of the author, to have the work stand "between the complete but cumbrous text-book and the incomplete but concentrated compend," has been

very well achieved. The work is a useful and thorough compilation of modern views and methods of surgery, giving, particularly in the chapters devoted to operative work, a useful guide to the student who undertakes his first operations in the surgical laboratory. The chapter on bacteriology, which opens the volume, gives a cursory review of the points of surgical bacteriology. The chapter on inflammation contains a section on pain which will be found useful to the student who is preparing for the final examinations. The chapter on syphilis is a summary of the views relating to the diagnosis and treatment of this disease at the present day. The author, in classifying the forms of aneurism, has made several sub-varieties of aneurism of equal importance with the principal, recognized forms. This has also been done in classifying inflammations, in which classification twenty-eight varieties are given. The illustrations, particularly those concerning the ligation of blood-vessels, are good.

J. M. S.

LOCAL ANÆSTHETICS AND COCAINE ANALGESIA. Their Uses and Limitations.

By Thomas H. Manley, A.M., M.D., of New York City. St. Louis: J. H. Chambers & Co., 1894.

The author in the above monograph presents much valuable information upon the subject of local anæsthetics and cocaine analgesia; but among the former we notice that he fails to mention the chloride of ethylene. We are inclined to think he overestimates the dangers of pulmonary anæsthetics, in attributing to them the evil results which often remotely follow their administration.

He presents himself as a very enthusiastic advocate of cocaine analgesia in minor and major surgical procedures.

We agree with the author as to the advantage and safety of using the weaker solution of cocaine, the solution he recommends being much weaker than that generally employed.

A careful study of the work cannot fail to be of advantage to those who make use of cocaine analgesia.

H. R. W.

DISEASES OF THE CHEST, THROAT, AND NASAL CAVITIES: including physical diagnosis and diseases of lungs, heart, and aorta; laryngology and diseases of the pharynx, larynx, nose, thyroid gland, and œsophagus. By E. Fletcher Ingals, A.M., M.D., Professor of Laryngology and Practice of Medicine, Rush Medical College; Professor of Diseases of Throat and Chest, Northwestern University, Woman's Medical School; Professor of Rhinology and Laryngology, Chicago Polyclinic, etc., etc. Third edition, revised. With two hundred and forty illustrations. New York: William Wood & Co., 1894.

The author disclaims any intention of writing an "encyclopædic work," and limits himself to diseases of the respiratory tract and circulatory organs. The latter portion of his work will commend itself to the nasal and throat specialist, while the general practitioner will value most the earlier pages, where the author discusses physical diagnosis and the treatment of chest disease. In physical diagnosis the author is definite, minute, and clear, and, if such a word be here possible, original. And when he enters upon the subject of disease his pages teem with valuable matter. In that still disputed ground, the therapeutics of pneumonia, he advises for the first two or three days aconite or veratrum viride in small but frequent doses, with fluid extract of ergot, \mathfrak{m} xxx, every two or three hours. The coal-tar antipyretics he uses sparingly. Cold as a local application he dismisses with the remark that "the constant application of heat or cold produces the same results in acute inflammation." Heart-failure the author meets by nux vomica and digitalis, but, writing, as he does, at a time when a day may bring forth almost anything or nothing, he makes only a brief allusion to the curative power of immunized animal serum.

In the chapters devoted to diseases of the circulation the reviewer fails to find

anything but a careful and intelligent discussion of the subject; but in the portion—fully one-half the book—devoted to throat, nose, and larynx, the specialist and would-be specialist in these branches may delve with great hopes of profit. The last pages are filled with formulas—often referred to throughout the work, and of undoubted use to those who are not already equipped with a similar lot of formulas—derived from some other special authority more or less celebrated.

One turns to the author's chapter on diphtheria with some interest, increased by the recent overthrow of old ideas and methods by the bacteriologist and his antitoxin. He believes diphtheria to be caused by the Klebs-Loeffler bacillus, and recognizes the fact that a pseudo-diphtheria exists—not due to this cause. Somewhat confusingly, however, he writes, page 329, "The necessity for assuming that there are two varieties of diphtheria—one produced by the Klebs-Loeffler bacillus, the other by other bacteria—seems to justify the statement that the identity of the specific micro-organism believed to cause the disease is yet uncertain."

Between bacillus and pseudo-bacillus, between cases of children who walk about, well, with the former in their throats, and cases of sick children who die, perhaps, with malignant membranous angina, with no such organism accountable, the mind of the average man is apt to become confused and his theories and actions uncertain. We doubt the evidence of our senses. Are only those cases of diphtheria which are not truly diphtheria at all curable by the vaunted old-time remedies, and what is pseudo-diphtheria and its pseudo-bacillus, and can children die of a throat affection which to the average cultivated eye exactly resembles diphtheria, or barely live? It is evident that they can, and for these cases no antitoxin, so far discovered, is of any use. While, on the other hand, they may have present in their throats the very visible sign and seal of diphtheria—the specific bacillus—and yet continue well and happy, their neighbors, perchance, dying with non-diphtheritic croups, anginas, and general blood contaminations from the union of the pseudo-bacilli and streptococci. These latter cases may be contagious, but the authorities will make no investigation, nor disinfect or quarantine, for the Klebs-Loeffler bacillus is not there.

Dr. Ingals is unfortunate in the fact that he wrote and published his book yesterday, for to-day is the day of antitoxin, and in medicine as theology "Now is the accepted time." But one cannot but ask, in moments of scepticism, "What has antitoxin done?" Do we really know the answer to this question? It claims a greatly reduced percentage of mortality; a reduction, however, not exactly from what have been in past time called deaths from diphtheria, but a reduction of mortality in true diphtheria. Now, as diphtheria has only just been accurately defined and limited by the biologist to cases of throat disease presenting the Klebs-Loeffler bacillus, we have nothing in the past with which to contrast our present mortality in such definite and assured diphtheria under the use of antitoxin. It will be said that these cases so discriminated embrace all the cases similar to the malignant and fatal cases in the older statistics, but not so. They may be mild and quite capable of self-recovery or yield to the remedies of yesterday, while the extremely bad cases which resist antitoxin are said by its advocates to die of other than diphtheritic poisoning. Now, can any one as yet assert that cases may not die with glandular engorgement, blood dyscrasia, and self-evident pseudo-membrane in which no specific diphtheritic bacillus can be found? Until this point is cleared up statistics will be doubly fallacious. To settle the question an equal number of carefully attested diphtheritic patients should be treated without antitoxin, and then we may rely on figures, for no one can at present tell what has been the mortality in the past in the class of cases which we might now term bacteriologist's diphtheria. Yet it is exactly these unknown figures which we need to contrast with the mortality after the use of antitoxin.

The author, knowing no antitoxin, takes the generally depressing view of the

valuelessness of all remedies in this disease. There is for him, too, as for the preacher, "Nothing new under the sun." "Iron, quinine, strychnine, and alcoholic stimulants have been employed for generations." This probably means one hundred years or more, but we doubt whether they have been employed so long, in the way they now are. For certain obvious reasons mercurials have not seemed to him of any great value. Of all the old remedies, *tinctura ferri chloridi* seems the best and most valuable; in fact, as we read his brief outline of treatment, we think that the time for some antitoxin has fully come.

E. W. W.

ESSENTIALS OF CHEMISTRY AND TOXICOLOGY. For the Use of Students in Medicine. Twelfth edition. (Wood's Pocket Manuals.) By R. A. Witthaus, A.M., M.D., Professor of Medical Chemistry and Toxicology in the University of Vermont. 32mo, 314 pages, muslin, red edge, \$1.00.

In this edition, which is the twelfth, that portion relating to the carbon compounds has been rearranged and largely rewritten in order to keep abreast of the times. The spelling employed is the more recent method adopted by the "American Association for the Advancement of Science." Thus, instead of sulphide, oxide, and sulphate, these words are written sulfid, oxid, and sulfate,—a change, perhaps, of questionable advantage. The first 170 pages are devoted to a classification and individual description of the sixty-nine elements and their combinations with each other; and then follows "Organic Chemistry or the Chemistry of the Carbon Compounds." Exception must be taken to the statement that *all* carbon compounds are organic, for carbon dioxide and carbon monoxide contain carbon while they are essentially *inorganic*. The toxicology of the mineral and alkaloidal poisons is considered, and numerous tests are given, which, together with a description of the symptoms and antidotes, form a most valuable addition to the scope of the work.

W. H. P.

MANUAL OF THE PRACTICE OF MEDICINE. By A. A. Stevens, A.M., M.D., Lecturer on Terminology and Instructor in Physical Diagnosis in the University of Pennsylvania. Third edition, revised. Illustrated. Pp. 501. \$2.50.

This work has reached its third edition in the short space of two years, which alone speaks well for the universal appreciation which has been manifested by the medical students and practitioners of the country at large. The few typographical errors of the first edition have been carefully corrected, and the book to-day is a valuable condensation of that which is pertinent to the practice of medicine of this progressive decade. It is notably conspicuous for its clearness of diction, terseness, and systematic arrangement of its subject matter.

W. H. P.

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[No. 2.

ORIGINAL COMMUNICATIONS.

SOME OBSERVATIONS ON PARESIS IN THE NEGRO.

BY P. T. VAUGHAN, M.D.,

Assistant Physician, Alabama Insane Hospital, Tuscaloosa, Ala.

FORMERLY certain races of people were supposed to be exempt from the variety of nervous disease known as paresis. Among those supposed to be exempt the negro race was prominently mentioned. That paresis is a disease met with rather frequently in the negro at the present time no one coming into contact with insane negroes can deny.

A disease like this, which has for its causation such factors as syphilis, a lowered moral tone, wants and privations of many kinds, must find many of its victims among a race in whom most of these conditions are found. That the percentage ratio of its occurrence among this class is constantly increasing appears to be of little doubt.

A careful examination of the medical records of the Alabama Insane Hospital for the past nine years reveals the fact that during that length of time six hundred and ninety negroes were admitted to the institution in whom insanity of various forms was present. If this period of nine years be divided into three periods of equal duration, it is found that during the first period, from January 1, 1886, to January 1, 1889, one hundred and forty-eight negroes were admitted. Among this number no cases of paresis were found.

During the second period, from January 1, 1889, to January 1, 1892, two hundred and fifty-nine negroes were admitted. Among this number one case of paresis was found.

During the third period, from January 1, 1892, to January 1, 1895, two hundred and eighty-seven negroes were admitted. Among this number

eight cases of paresis were found. In the first period the ratio of occurrence among the admissions was nothing. In the second period it was thirty-eight-hundredths of one per cent. In the third period the ratio of occurrence had increased to two and seventy-eight-hundredths per cent. of the negro admissions, or during the three years ending January 1, 1895, the occurrence of paresis among the negroes admitted had become a little over seven times more frequent than in the three years immediately preceding. If there have been any other cases of paresis occurring among the negroes admitted from the opening of the institution thirty-four years ago to the present time, except the nine cases reported in this article, the medical records of the hospital fail to show them.

For the sake of fairness it is proper to state here that previous to nine years ago the medical records of the institution were kept in such a loose manner that as records from which to deduce scientific opinions they are not of much value.

The most plausible theory of this increased frequency of paresis among the negro race appears to be found in the changed mode of living made necessary for them by changes in their environment since their emancipation.

Prior to the emancipation of the negro, the habits taught and the principles instilled into the slave all tended towards the better development and the better preservation of good physical and good moral natures in them. Want, need, and poverty were conditions rarely known to them. Competition of no kind was necessary in order for them to subsist. Mental activity and mental strife were conditions entirely foreign to them; in fact, they were merely living automatons, working under directions from some supervising head.

Syphilis was comparatively frequent in its occurrence before emancipation, but it was not met with anything like the frequency that it now is.

With the advent of their freedom came a different order of things. In contradistinction to the easy life they had previously led came various wants, cares, and responsibilities. A keen competition for existence became necessary; and, last, the negro has developed a taste for strong drink, and has adopted a low standard of morals almost unknown to any other race.

That the nervous organization of the negro is unable to cope successfully with these increased demands upon his energies is fully demonstrated by the fact that during the past thirty years there has been a constantly-increasing proportion of them falling into the ranks of the degenerative classes,—the criminal and the insane.

Owing to the fact that accurate personal and family histories are almost impossible to obtain from negroes, nothing definite can be asserted regarding the etiology of the disease in the cases admitted. Two of the females admitted were prostitutes, and have definite histories of having contracted syphilis. Concerning the remaining six cases, nothing at all is known before they became inmates of the hospital.



FIG. 1.—CASE I.

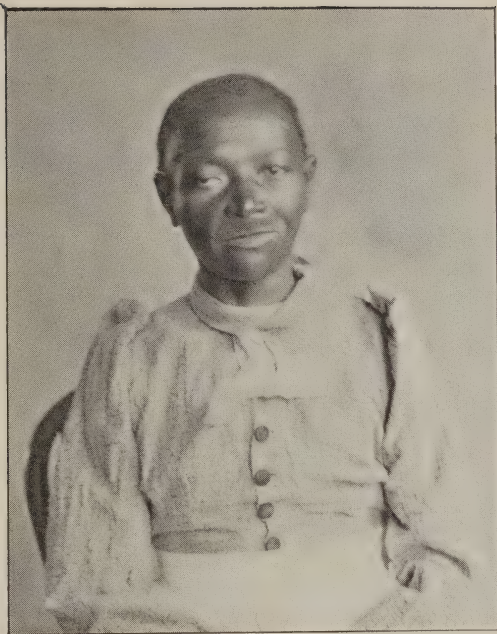


FIG. 2.—CASE II.

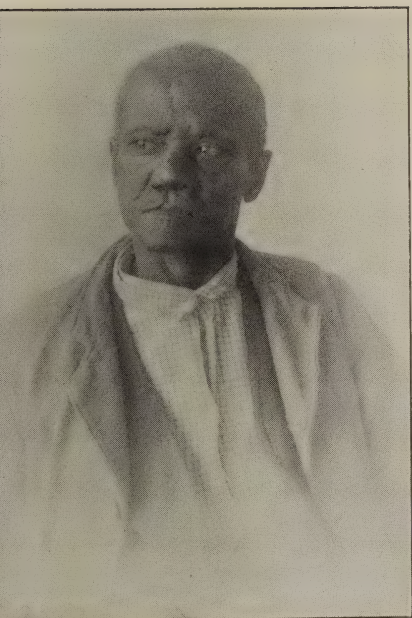


FIG. 3.—CASE III.



FIG. 4.—CASE V.

The diagnosis of paresis in the negro does not vary from its diagnosis in the white person.

Paresis is usually so insidious in its approach that negroes in the first stage are rarely seen in the hospital, unless the disease be ushered in by an attack of acute mania.

The absurd delusions, the peculiar embarrassment of speech, the fibrillar tremors of tongue, and of groups of muscles in the extremities, the absence, or increase, of reflexes, the unsteady gait, the alterations in size of pupils, —all these symptoms are usually so well marked and present such a typical picture of paresis that there is no difficulty in making a diagnosis.

Syphilis involving the nervous system is the condition most frequently mistaken for paresis, but a few days' treatment of the suspected case with iodide of potassium clears the diagnosis.

CASE I.—A. L., an octoroon female patient, was admitted to the hospital November 15, 1892; was forty-five years of age, strong, and muscular. By occupation she was a prostitute. Had never been insane before this attack. Was insane for one month prior to admission.

Nothing of importance could be learned concerning her. She has had four children, although she was never married.

When admitted she was mildly excited and very fond of talking. Claimed that she had two thousand dollars in bank, and that she made one thousand dollars every night. Talked in a most confidential manner about her affairs. Delusions of grandeur and general feeling of well-being were decidedly marked. She had had syphilis.

Physical examination showed her to be well nourished. Skin was clear and free from marks, bruises, or eruptions. Some œdema of the lower eyelid was present, but there was none elsewhere. Head was somewhat asymmetrical. Face quite broad and ear-lobes attached. Sensation was normal. A slight impediment to gait was noticeable in beginning and stopping locomotion. There was some loss of co-ordination with feet together and eyes shut. Patella reflexes were absent, and pupils were very contracted. Pupils reacted rather slowly to light. There was a distinct fibrillar tremor in tongue when protruded, and also in right side of upper lip when talking. Speech was impaired, there being some alalia, and a general running together of words. Examination of chest and abdomen was negative. Analysis of urine showed: color, normal; specific gravity, 1015; some albumin and some hyaline casts present. Pulse, respiration, and temperature normal. There was no arterial sclerosis present.

Her condition did not change for several weeks after her admission. During the early part of December she commenced having severe headaches, and spent a good deal of time in bed. On December 29, the following note was entered on the history book:

"Sensation impaired. Symptoms: gait unsteady with feet wide apart. Some swaying with feet together and eyes closed. Muscular strength unimpaired. Lips tremulous. Tongue protruded straight; some fibrillar tremor. Utterance thick, stumbling, and indistinct. Long and difficult words slurred. Movement of eyes and eyelids unimpaired. Pupils contracted, insensible to light, but react promptly to accommodative effort. They are of equal size. Ophthalmoscope shows no retinal lesion. Vision normal. Patella reflex absent. Mental state that of a typical parietic exaltation. She laughs and is very cheerful, has money, is perfectly healthy, and is

much stronger than other women. She has a remedy which will cure any disease in five minutes. Weight to-day, one hundred and forty-two pounds."

During January she remained very quiet, but constantly lost flesh. Had a coughing spell which would last a half-hour every morning. In February she was quiet and good natured, and improved some in physical condition. During May she complained a good deal of her fingers hurting her. On June 20 she remained in bed, complaining of headache. About ten o'clock she commenced having convulsions of an epileptiform nature. She had ten of these convulsions in four hours. During the intervals between the convulsions she was given hypodermics of pilocarpine, nitro-glycerin, and also of a ten-per-cent. solution of camphor dissolved in olive oil. This latter was given to sustain heart action, which was very weak, and also to overcome the œdema of lungs which was present. After she had perspired freely, the convulsions ceased. On the next day there was great impairment of sensation on all of right side, and there was also an inability to speak. She had no control over her bladder sphincter. On the evening of the 21st she commenced again to have very hard convulsions; had twenty during the evening and night, and five on the next morning. Immediately upon the recommencement of the convulsions she was again given hypodermics of pilocarpine and camphorated oil. She was also given aloin hypodermically, and a rectal injection of warm water.

On the 24th she was ordered thirty grammes of magnesium sulphate daily. On the 27th she was put upon chloride of iron tincture. She was up and walking about the ward during the next few days, but there was considerable impairment of sensation on the whole of right side of body, and she was also very weak. An examination after this attack showed parietic symptoms to be much intensified. Was quite excited, and also bothered considerably by bedsores contracted during her attack of convulsions. She steadily improved for several months after convulsions ceased, and gradually regained her former physical condition. The following January showed her very much demented, but in good physical condition; gait good and sensation good.

From January to April practically no change took place. In August she began to look very badly. Lower eyelids became very œdematous. She was very troublesome, and inquired constantly when she would be allowed to return home. On November 18 she had an attack which was characterized by partial anæsthesia of left leg and arm, with convulsive seizures of them. Mental state was very much worse than usual. Talked incessantly in a rambling, disjointed, incoherent manner about going home to her property and money. Face under eyelids was quite œdematous. Lungs were œdematous. Was given hypodermics of pilocarpine and camphor dissolved in olive oil in morning, and thirty grammes of magnesium sulphate at night. Next day was feeling much better. All symptoms had subsided, and she was sitting up in bed. During November and December her moral shamelessness was something astonishing, even for a parietic.

At present she is doing very well. Physical condition is very good, but mental state is one of great dementia.

CASE II.—L. S., a mulatto female patient, was admitted to the hospital on February 15, 1892; was forty years of age, five feet five inches in height, and weighed one hundred and thirty pounds. By occupation she was a cook. Had never been insane before this attack. Was insane for two months before admission. No insanity known in family. No history of ancestry or childhood could be obtained. About two weeks before her admission her husband died of a lingering illness,—paralysis. Before his death patient gave evidence of mental failure, but after that event she became quite violent. Insanity was made manifest by her resenting any and all control, by abusive language, and by a desire to stray away from home. Her general health on admission was fairly good. She answered questions quite intelligently, was very quiet in deportment, and appeared somewhat depressed. Seemed

to take no interest in her surroundings. Physical examination showed her heart to be normal and lungs to be normal. Alopecia marginalis was present.

On February 24 she was still very much depressed, and begged to be allowed to return home to look after some property of hers. On March 1 she refused to get out of bed, saying she was made of glass, and if she got up she would break into a thousand pieces. About then she began to cry a good deal. On May 6 persecutory delusions began to be well marked. She declared that a tramp came into her room every night, and threatened each time to kill her. Hysterical spells had become of frequent occurrence, and she had become unable to do any work upon which her attention had to be fixed. Even her knitting was worthless. Before coming to the hospital she used both whiskey and morphia. Was treated with tincture of nux vomica under the belief that it was morphia. Did very well until this was stopped, but after its cessation she insisted that she could do nothing. Her weight had increased and her appetite had become enormous. Her urine was examined and showed: color, normal, clear; reaction, acid; specific gravity, 1020; some albumin, some large and small hyaline, nucleated, granular, and cork-screw casts found.

She remained in practically the same condition from May until August, when she became very much excited. After August the physical symptoms began to be more prominent.

On December 29 the following note was recorded in the history book:

"Sensation: partial anæsthesia over forehead and upper portion of face on both sides; utter inability to distinguish the point from the head of a pin. Little or no pain is felt when the pin is thrust deep enough into her flesh to bring blood. Over chest, forearms, and legs, as well as lower portion of face and neck, there is no impairment. Motor symptoms: grip in hand is very feeble. Right eyelid droops, but by extreme effort of will can be partially raised. Mouth is drawn to right side, and labio-nasal fold on left side is partially obliterated. Tongue protrudes straight, some fibrillar tremor. Tremor of lips distinct. Movement of eyes unimpaired. Distinct irregular tremor of hands and fingers. Gait not typical of paresis. Some swaying with eyes closed. Pupils: right, medium-sized; left, pin point. Both are insensible to light, but react promptly to accommodative effort. Ophthalmoscopic: papillæ, normal, or nearly so. In left a line of pigment at periphery. Left retina is pale and grayish,—its vessels are small, and below the disk there are some radiating white lines. Vision is impaired. Patella reflex is absent. Facial expression is blank. She is cheerful, and laughs when spoken to. Talks rather rationally, and to-day exhibits no delusions. Examination of chest negative. Weight, one hundred and thirty-seven and a half pounds."

For the three months prior to the above note she remained in practically the same condition,—as a rule, quiet, with occasional periods of mild excitement, at which times she would exhibit delusions. Occasionally during that time she complained of severe headaches.

In January she began to be dull and stupid. Would sit in one position for hours, and take no interest in any one or anything.

From January to June her condition changed very little, except that the severe headaches spoken of before became of much more frequent occurrence. In July she became very much excited. Would for hours at a time shout at the top of her voice in rapid succession the words "Moody, archangel, holiness." Physical condition began at this time to deteriorate. Her gait became very much altered: she simply drifted along.

From the date of the above note made in July to the following January, there was a very slow but constant change for the worse in her condition. She became gradually more demented, and the physical signs became more intensified. In April there was a great outbreak of boils over her head and face. With this outbreak she began to gain flesh, but her mental condition grew worse. Nothing of importance

occurred from April on until about eight months later; in December she had an apoplectic attack, with resulting paralysis of right side of face, right arm, and right leg. Could not swallow or talk. Had no sensation within affected area. The paralysis was complete. On December 20, the day after the apoplectic attack, convulsive twitchings were noticed within the paralysis area, and evidences of returning sensation were present.

During this attack she was troubled with retention of urine and fæces. She has steadily recovered from this attack, and to-day (January 8, 1895) is up and in the ward, sitting about, apparently as well as before it occurred.

CASE III.—T. J., a negro male patient, was admitted to the hospital on January 31, 1892; was fifty years of age, five feet five inches in height, and weighed one hundred and twelve pounds. By occupation he was an office boy. Had never been insane before. Was insane for four months previous to admission. No insanity was known in his family. No history of ancestry or childhood could be obtained. Alleged exciting cause of insanity was an injury he had received; he was run over and knocked down by a horse. His lip, his nose, and the right side of his face were all very much disfigured, but he was not injured sufficiently to become insensible. When admitted he was mildly excited and very incoherent in his conversation. He had quite a number of delusions of an unsystematized order. Physical examination showed lungs to be normal. A systolic murmur was heard at the apex and transmitted to the right. Body was somewhat emaciated, and the supraclavicular spaces were very much depressed.

In a note made two weeks after admission it is stated that his excitement was of a very harmless nature. He kept a rag in his mouth all the time to keep him from being poisoned. Was afraid he was going to be killed. Had a delusion that he possessed a good deal of money. Analysis of urine showed: color pale, reaction neutral, specific gravity 1004, no albumin, and no casts.

The latter part of February he became very noisy and excited, but this state soon gave way to one in which he was exceedingly talkative without being noisy. Conversation was incessant, and always turned upon the vast amounts of money he owned. For the succeeding twelve months he remained in practically the same condition, working out regularly every day. About fifteen months after being admitted he complained of being rather weak, and was allowed to remain in ward all the time.

From the time of his admission to six months ago there was nothing about him to excite suspicion of paresis except his grandiose delusions. His gait was very good, his articulation very good, reflexes normal.

For the past six months he has steadily lost ground, both physically and morally. When examined recently the following conditions were found to be present: Sensation very good all over body. Motor symptoms: some swaying with eyes closed and feet close together; impossible to stand on one foot; gait unsteady; fibrillar tremor of tongue when protruded, and of upper lip when talking, very decided; speech impairment very characteristic of the disease; patella reflexes very much exaggerated. Pupils: left one a good deal smaller than the right; neither one reacts to light, but reaction to accommodative effort is good. Mental condition very typical of paretic exaltation. He owns the hospital, the cities of Birmingham, Charleston, Atlanta, and Chicago, and several States. Very good-natured and easily satisfied. Moderately well nourished physically. Urinary analysis: color light, alkaline reaction, specific gravity 1010, albumin, also some large and small hyaline casts were present.

He walks about the ward during the day, and is of considerable assistance to the attendants in looking after the other patients. His appetite is good, and he sleeps tolerably well.

CASE IV.—A. M., a negro male patient, was admitted to the hospital on August 4, 1893; was fifty years of age, six feet in height, and weighed one hundred and fifty

pounds; by occupation he was a farmer. Had never been insane before this attack; was insane for one year previous to admission. He knew of no insanity in his family. No history of childhood or ancestry could be obtained. Before being admitted here he had been confined for one year alternately in the jail and the poor-house of Macon County. The alleged cause of his insanity was loss of property, his crop and fixtures having been taken from him on account of debt. When admitted he was mildly excited; was very talkative, and had innumerable delusions, chiefly of a grandiose nature. Physical examination showed heart and lungs to be normal. Reflexes were rather slow to respond. Urinary analysis showed: color normal, turbid, acid reaction, specific gravity 1012, some albumin, some indican, as well as some large and small hyaline and nucleated casts.

He remained in practically the same condition from the time of his admission to November, 1893. Prior to that time he worked out in the field every day with the other male patients. Early in November it was noticed that he was becoming a little thinner than formerly, and although he did not complain at all of any physical ailment, he was stopped from going out to work. At this time his condition was good. The physical symptoms of paresis had remained latent, the disease being only manifest mentally and by the very slightest embarrassment of speech.

Commencing December 1, on which day he became much more excited than usual, his decline was very rapid. On December 2 he had an attack, in which his power of co-ordination left him. On December 3 he was very much excited and was very talkative. Sensation all over body was good. There was some paresis of upper lip on left side. Fibrillar tremors in tongue and in various groups of muscles in extremities were very marked. Sphincters were intact.

On December 4 his reflexes were more active than formerly. Entire upper lip was slightly paralyzed. Labio-nasal folds on both sides had become very indistinct.

On December 7 he commenced to be very filthy, soiling himself several times daily. Was still very talkative, but was gradually becoming weaker. From the date of the above note he gradually grew worse, all of the paretic symptoms becoming more intensified, until on January 23, 1894, he died.

The immediate cause of his death was an acute exacerbation of a chronic kidney lesion.

The grandiose delusions persisted up to death. On autopsy the usual pathological findings in paresis were present, but had not advanced very far, owing to the fact that he died in an early stage of the disease.

CASE V.—L. W., a negro female patient, admitted to the hospital on December 15, 1893; was thirty-seven years of age, five feet three inches in height, weighed one hundred and fifteen pounds. She was married, and by occupation was a washer-woman. Had been insane for one year previous to admission. She knew of no insanity in her family. No history of childhood or ancestry could be obtained. Circumstances had always been easy pecuniarily, and married life had been happy. Social relations had always been friendly. Had never had any serious illness other than "rheumatism." Had had one attack of insanity prior to this one, but how long ago could not be ascertained. She had been a drinker of liquor and a user of tobacco. Had always been considered rather weak-minded. Insanity became manifest by a desire on her part to be very noisy and to stray away from home. Had no delusions of persecution, and had not slept well at night before being admitted. She had fallen off in weight, although her appetite had remained good. When admitted she showed a mild state of excitement,—talked in a rambling, disjointed, good-humored manner. Conversation was very much disconnected. No delusions of any kind were discovered. Reflexes, gait, and sensation were all normal. Physical examination showed heart and lungs to be normal; no marks or scars were discovered on her body. Analysis of urine showed: color normal, sediment scant,

reaction alkaline, specific gravity 1020. A small amount of albumin was present, as well as some large and small hyaline casts.

Several days after her arrival she was re-examined, and her patella reflexes were found to be slightly exaggerated. Her other functions, gait and speech, remained unchanged.

Six weeks after her advent here she was again examined, and very material changes were noticed. Severe headaches were of frequent occurrence. She had become more excited, and her conversation had become more incoherent. There was found some slight tremor of upper lip while talking, and some fibrillar tremor of tongue when it was protruded. Her tongue did not deviate to either side when protruded. Sensation was unimpaired. Pupils were normal. She had become very filthy in her personal habits, soiling herself at times. Her gait had become somewhat impaired.

A month later, upon examination, all of the paretic symptoms were found to be intensified. She had developed a great many delusions, chiefly of a grandiose nature. At times she became very vulgar, profane, and abusive. A very decided fibrillary tremor was present in various groups of muscles in all of her limbs. The impairment of her speech had become very typical of paresis. Later on, in March, the state of excitement gave way to one of dementia. She would spend hours at a time playing in the sand, "making cakes." She became more filthy monthly in her personal habits. Her condition grew steadily worse. In April she developed tuberculosis, and afterwards rapidly declined until May 29, on which day she died.

On autopsy the usual pathological conditions found after death in paretics were present, but they were in a very early stage of development. The development of the tubercular process was sudden, and its progress was very rapid.

CASE VI.—H. H., a negro male patient, was admitted to the hospital on June 19, 1894. He was thirty-eight years of age, five feet six inches in height, and weighed one hundred and forty-five pounds. He was married, and by occupation was a day laborer. No history of insanity in family could be obtained; in fact, no information could be obtained concerning his ancestry, his childhood, or his previous habits. When admitted he had been for some months an inmate of the Mobile County poor-house.

Examination on admission showed him to be fairly well nourished. Head was dome-shaped and of ordinary size. The teeth of superior maxillæ were gone. There were no lobes to his ears. Patella reflexes were normal. Gait was somewhat unsteady. There was marked ataxia of upper extremity. Tremor in hands was very bad,—could not button his coat or hold a plate or a cup in his hand without excessive trembling. Speech was incoherent, and articulation was very faulty. Lungs and heart were examined with negative results. Urinary analysis showed: color normal, reaction acid, specific gravity 1020, some albumin and some hyaline casts were present.

He thought that he possessed great wealth; was very talkative, and conversation was very incoherent.

Nothing of note occurred during July and August. During September he had two convulsions of an epileptiform nature, but his recovery from these was rapid and complete. He did very well for the two months succeeding, but late in November he had an apoplectiform attack. He could not talk; remained in bed, lying flat on back,—apparently paralyzed all over. Sensation all over body was very much impaired. Patella reflexes were very much increased. Sphincters were intact. In several days he recovered thoroughly from this attack, and retook his accustomed place in the ward.

He became very useful about the ward, assisting the attendants with the other patients, and helped them in various ways. Has been ever since admission good-humored and harmless.



FIG. 5.—CASE VI.



FIG. 6.—CASE VII.

Dr. Vaughan's Cases of Paresis in the Negro.



FIG. 7.—CASE VIII.

When examined recently, the following conditions were found. Sensation: cutaneous surface very hyperæsthetic. Motor symptoms: gait very unsteady. There was a good deal of swaying with eyes closed and feet together, and also an inability to stand upon one foot. Fibrillar tremors in tongue when protruded and also tremors in upper lip when talking were present. Fibrillar tremors were also present in various groups of muscles in extremities. Speech had become very characteristic of paresis. Pupils were found to be normal in size, to react promptly to both light and accommodative effort. Patella reflexes were very much increased. Urinary analysis: color, normal; acid reaction; specific gravity, 1024; some albumin, some large and small hyaline and nucleated casts were found. Mental condition was a typical paretic exaltation. Very well satisfied with himself: had plenty of money, health was always good, was a very strong man, and a good many more delusions of a similar nature were present.

Since the above note no changes of interest have taken place. He is good humored and good natured, always ready to talk, but his conversation is very disjointed and incoherent.

CASE VII.—D. H., a negro female patient, admitted to hospital on December 8, 1894. She was thirty-seven years of age, five feet five inches in height, and weighed one hundred and fifty pounds. She was married. Had never been insane before this attack, and this attack had been manifest for three months prior to admission.

Her father died of rheumatism at the age of seventy years, and her mother is still living, at the age of seventy five. One of the sisters of the patient has epileptic fits. Nothing peculiar was noticed during the childhood of the patient. She was married at seventeen, and has had two children. Her circumstances pecuniarily have always been moderate. Lately she became very jealous concerning her husband. Her social relations have always been friendly. She has never had any severe attack of illness.

Her insanity was ushered in by her becoming suddenly indecent in talk and destructive to clothing. Delusions were absent. She was restless at night, appetite was good, and she was uncleanly in personal habits.

On admission she was very restless, and refused to talk about herself or the cause of her coming here. Physical examination showed a presystolic roughness of the heart-sound at the apex. Lungs were found to be normal. Gait and sensation were normal. Analysis of urine showed: color, light; specific gravity, 1008; some albumin, and some large and small hyaline and epithelial casts.

On December 20, about two weeks after admission, she became suddenly very much excited,—singing and shouting all the time. She gradually quieted down, and when examined a week later, it was found that she talked moderately rationally. There was slight swaying of body, with eyes closed and feet together. Tongue, when protruded, showed a good deal of fibrillar twitching, but it did not deviate from the median line. She could not tell the difference between the head and the point of a pin when touched with one. There was a slight impediment to her speech, and a monotonous drawl to her language. Patella and triceps reflexes were very much exaggerated. No pupillary disturbances were noticed.

She was examined again several days ago, and almost all of her paretic symptoms were found to be intensified. Sensation about the same. There was more swaying of body with eyes closed and feet together. Fibrillar tremors of tongue when protruded, and of upper lip when talking, also of various groups of muscles in extremities were very marked. Impediment in commencing and ending locomotion was very decided, but gait was good. Reflexes, particularly the patella, very much increased. Pupils were very small and of equal size. There was some slight reaction to accommodative effort, but no reaction to light. Mental condition was one of dementia with varying and shifting delusions.

Since the above examination was made, there have been no changes of importance, except that the impairment of her speech has become very typical of paresis.

CASE VIII.—M. T., a negro female patient; admitted to hospital December 20, 1894; fifty years of age; five feet four inches in height; weighed one hundred and twenty pounds. She was married.

No history of insanity in family could be obtained; in fact, no information could be obtained concerning her ancestry, her childhood, or her previous habits. She had never been insane before this attack. Was insane two years previous to admission.

When admitted she was very talkative, and had a good many delusions of a varying and shifting character. Physical examination showed heart to have a murmur occurring with diastole over aortic interspace, and lungs to be normal. Reflexes, particularly the patella, were very much increased. Pupils were very small, and failed to react to light or to accommodative effort. Gait was shambling and very unsteady. Could not stand with feet together and eyes closed. Face was drawn slightly to right. Labio-nasal folds were almost obliterated. Fibrillar tremors in tongue when protruded, and of lips when talking, very marked. Fibrillar tremors were also present in various groups of muscles in different extremities. Anæsthesia to a very marked extent was present in various parts of the body. Syllabic stuttering was present. Arcus senilis was very marked. Analysis of urine showed: color, normal; reaction, acid; specific gravity, 1020; some albumin, and some large and small hyaline, granular, epithelial, and nucleated casts.

When she was re-examined several days later, the evidences of paresis were very marked. She was mildly excited, talked a good deal about "Thomas" and great quantities of "rails." No delusions of wealth could be obtained from her.

She was again examined several weeks later, and sensation was found to be tolerably good. Motor symptoms had not changed materially since admission. Fibrillar tremors were possibly more marked than a month previous. Her speech was very characteristic of paresis,—the syllabic stuttering and the slurring of long words both being very marked. Physical condition only moderate. Mental state was one of decided dementia. Conversation exceedingly disjointed and rambling in character.

Since her admission she has been good-natured and harmless. Talks a good deal, but is not abusive, profane, or vulgar. Has been alternately mildly excited and mildly depressed ever since her admission. Her delusions have been very varying and shifting in character. She has become lately very filthy in personal habits. At no time since her admission has she been sufficiently excited to need a sedative or to be secluded.

Of the eight cases admitted since January 1, 1892, two have been of the tabetic form, while six have been of the spastic form. Both cases of the tabetic form occurred in women, and in both cases a positive history of syphilis was obtained. As to the causation of the disease in the other six cases, nothing of a definite nature can be learned. In one case injury to the head is given as the cause of the attack. In another case, whiskey and immorality are the causes given. In another case, mortgage, debt, and worry are the causes given. In the three remaining cases no causes are given. In all of the cases cutaneous anæsthesia affecting different areas of the body has been at different time present. In every case very marked embarrassment of speech and articulation has been present. No aphasia has been present in any case. The vitality of the cutaneous surfaces has

been in each case which has progressed to any considerable extent very easily destroyed. Epileptiform attacks have been present in only two cases. Apoplectiform attacks have occurred in only two cases. Pupillary disturbances have been present in about two-thirds of the cases.

Repeated urinary analyses have been made in each case, and in every instance very bad conditions of the kidney have been found.

The variety of the insanity accompanying the paresis has varied greatly in different cases, ranging from acute mania to intense melancholia. One case is of the double form,—depressed and excited alternately. Grandiose delusions have been present in a great majority of the cases at some time since admission.

TUBERCULAR AFFECTIONS OF THE KNEE-JOINT; PATHOLOGY AND SYMPTOMS.

BY WM. MACKIE, M.A., M.D.,

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THE subject of tubercular affections of the knee-joint is of the greatest importance for two reasons: *first*, because of their relative frequency, and, *second*, because of their comparatively common occurrence after the thirtieth year, when such affections are apt to be overlooked.

As to their relative frequency, the combined statistics of Jaffe, Schmulfuss, Billroth, Menzel, and Cheyne show that they follow next in order to tubercular affections of the spine, where patients of all ages are included. According to these writers, they constitute 16.5 per cent. of all tubercular affections of bones and joints. The following table gives the percentages in detail.

	Per cent.
Spine.....	23.2
Knee-joint.....	16.5
Hip-joint.....	14.6
Tarsus and ankle.....	14.4
Elbow-joint.....	6.3
Wrist and hand.....	6.0
Sternum, clavicle, and ribs.....	5.2
Pelvis.....	3.5
Femur, tibia, and fibula.....	3.5
Shoulder.....	1.5
Scapula, ulna, and radius.....	1.0
Humerus.....	0.8
Patella.....	0.1

As to age, the majority of cases as met with in practice appears to occur in children and young adults; but when all cases of surgical tuberculosis

are included, tubercular affections of the knee-joint reach their maximum in the fourth decade of life. Of 149 cases collected, Cheyne found 29.5 per cent. in the first decade, 22.8 per cent. in the second, 18.2 per cent. in the third, 36.6 per cent. in the fourth, and in the fifth 6.2 per cent. The following table shows the distribution of the disease in each joint in the different decades :

	Hip.	Knee.	Ankle.	Tarsus.	Shoulder.	Elbow.	Wrist.	Spine.
First decade.....	32.2	29.5	5.4	4.6	.....	6.7	6.6	12.0
Second decade.....	20.3	22.8	5.9	5.9	1.6	9.2	8.4	15.2
Third decade.....	4.8	18.2	3.6	8.4	4.8	6.0	15.8	28.0
Fourth decade.....	.....	36.6	3.3	3.3	.....	13.3	13.3	20.0
Fifth decade.....	12.5	6.2	12.5	18.7	.....	18.7	6.2	12.5

In the foregoing tables all the strumous or scrofulous diseases of joints have been included, it being a demonstrated fact that scrofula, struma, and tuberculosis are due to the same essential cause,—viz., the bacillus of tuberculosis. It is true that, in cases of strumous and scrofulous diseases of the knee-joint, the presence of the bacillus of tuberculosis cannot be always proven microscopically. This is due to the fact that the bacilli are few in number. Koch found the bacillus present in twelve out of thirteen cases of bone and joint tuberculosis; Schuchardt and Krause found it present in ten of synovial and in three of osseous tuberculosis examined. Cheyne asserts that the bacillus is present in every case, and failure to find it is due to our present defective means of staining. The evidence of the microscope is, however, only positive in such cases, and the absolute method of diagnosing doubtful tubercular lesions is by the inoculation of susceptible animals with the suspected tissue or products of the same. Take, for example, some of the granulation tissue from a case of fungous arthritis, and implant it in the subcutaneous tissue of the guinea-pig. A nodule first forms at the site of implantation, the nearest lymphatic gland becomes involved, then the next in order, and so on until a general tuberculosis is established, and the animal dies in the course of five or six weeks. Reinfection from the tissues of this animal can be effected, and the presence of the bacillus of tuberculosis in the organs demonstrated microscopically.

Pathology.—The bacillus of tuberculosis being the cause, the pathology resolves itself into a description of the changes subsequent to its localization in the different tissues and structures entering into the formation of the knee-joint. Once localized, it excites inflammatory changes characterized by their chronicity and by the formation of a small nodule or tubercle, which, histologically, consists of leucocytes, epithelioid and giant cells, and cell detritus. The structure of this tubercle is always constant, irrespective

of the tissue in which it develops; hence its histological formation and growth will first be considered. This can best be studied in an artificially produced tubercle of the cornea. Baumgarten found that the first effect of the penetration of the bacilli into the tissues was proliferation of the fixed cells, with characteristic karyokinetic nuclear changes,—*i.e.*, they revert to their embryonal condition, and as such have been termed epithelioid cells, and from them, at a late stage, by hypernutrition, is formed the so-called giant cell. Coincident with, and as a result of, these inflammatory changes migration of the leucocytes from the vessels in the affected area occurs, and by a concentration of these about the focus of tissue proliferation, and a coagulation necrosis of the centrally located cells (caseation), a tubercle is formed. Hence, theoretically at least, a tubercle may be said to be made up of three zones,—an outer, where tissue proliferation, the result of a specific inflammation, is active; a middle, where it is less active; and a central, where it has ceased (caseation). This is exactly what occurs in the non-artificial disease, as a consideration of a single tubercle will show. Microscopically, a single tubercle is circular or oval in shape, and, on staining with hæmatoxylin, is found to consist of two parts,—a central portion, the larger, faintly stained, and an external, much narrower and more deeply stained. The former is the essential part of the tubercle, and the latter is an adventitious or protective wall, the result of an active inflammatory tissue proliferation. The central portion is made up of epithelioid and giant cells,—*i.e.*, fixed tissue-cells in their embryonal condition, and these same embryonal fixed tissue-cells, in a state of hyperplasia, intermixed with some wandering leucocytes. These epithelioid cells are larger than leucocytes, flattened, and contain a large oval or elongated nucleus, distinctly granular, and more faintly stained than the nuclei of the leucocytes. They occasionally contain more than one nucleus, and form the bulk of all recent nodules. Cheyne and Baumgarten consider these epithelioid cells as diagnostic of tubercle. It is in connection with these cells, either lying between them or in their interior, that the bacillus is to be found, and never among the inflammatory cells beyond, where more active tissue-changes are going on. When the bacillus occurs in the interior of the cell, it is often applied closely to the nucleus. In the central portion are also found the giant cells, which consist of large masses of protoplasm (hyper-nutritified epithelioid cells) with projecting processes ramifying between the epithelioid cells and adjoining like processes from a neighboring giant cell or those from an epithelioid cell. It is this arrangement, according to Cheyne, that constitutes the reticulum of a tubercle, while others hold that it consists of pre-existing connective tissue pushed asunder by the new cells or a secretion from the epithelioid cell, which, on becoming firm, resembles connective tissue. They (the giant cells) contain several nuclei arranged irregularly in the cell, either in the form of a complete or an incomplete circle around the margin, or collected together at one end. These cells are not always present in tubercle, but when present the bacilli are generally

found in largest numbers in their interior, and may be present only there. The leucocytes found in the central portion are such as have migrated in a centripetal direction from the outer portion of the tubercle. This outer portion, the more deeply stained, is made up of escaped leucocytes and fixed tissue-cells in the active state of inflammatory proliferation.

A tubercle, as described, now constitutes an infective focus. It does not remain single unless it be that the resisting power of the tissues is such as to counteract and overcome the evil effect of the bacillus and its ptomaines, so that by absorption and a return of part of this embryonal tissue to its mature prototype the progress of the inflammatory process is arrested; otherwise fresh tubercles spring up around it, which in turn coalesce with the old. Fresh tubercles appear around this, and thus the tubercular process extends.

A "tubercular infiltration" has been described by Cheyne as occurring in joint and bone tuberculosis. This is met with or without the nodular form, and, instead of the epithelioid cells being collected in small masses, they either run through the tissues as broad tracts or are simply scattered irregularly among the tissue elements. Giant cells and bacilli are to be found in this mixed tissue. This constitutes the granulation-like tissue found in cases of synovial tuberculosis, where caseation is going on.

The subsequent changes a tubercle may undergo are atrophy, caseation, and calcification.

1. Atrophy has already been referred to. Here the resisting power of the tissues is such that the primary cause, the bacillus and its products, has been overcome. Some of the cells of the tubercle undergo more or less fatty degeneration, and others of the epithelioid cells, by resumption of their former condition, are transformed into fibrous tissue.

2. Caseation is the process by which the gray tubercle is transformed into the yellow or cheesy, and is almost pathognomonic of tubercle. Two factors are concerned in this transformation,—first, the avascular condition of the tubercle, and, secondly, the action of the ptomaines of the bacillus on the epithelioid cells. The absence of blood-supply will result in fatty degeneration only, but the ptomaines produce a coagulation necrosis of these cells centrally located,—that is, in the oldest part of the tubercle and farthest removed from any vascular supply. The first change observed is in the protoplasm of the cells, which loses its finely granular appearance and assumes a coarser aspect. Then fragmentation of the nuclei ensues, the cell structure becomes indistinguishable, and the nodule is transformed into a mass of cell *débris*. This change, starting in the centre, extends in a peripheral direction and involves the epithelioid cells in the receding inflammatory area. Thus the caseating nodule enlarges and coalesces with an adjoining caseating nodule by the extension of the same retrograde changes into the whole of the area of active cell proliferation which separated the nodules originally. When this process is rapid, and fluids pass by imbibition from the inflammatory area, there results tubercular suppuration, or

the formation of a tubercular abscess (cold abscess). Again, the progress of the disease may become arrested by the encapsulation of the caseating nodule. In this case the resistance of the tissues has overcome the infective power of the bacilli, and the epithelioid cells return to their fully-developed state, forming a fibrous or bony wall around the degenerated nodule. This nodule may remain latent for an indefinite time and retain its infective property.

3. Calcification consists of the infiltration of the degenerated nodule with calcareous salts, and occurs either where the degenerative process is slow or after encapsulation has taken place.

Having described a single tubercle histologically, its method of growth and subsequent changes, it remains to extend this to the occurrence of tubercles, singly or in groups, modified as they are by the structures in which they are found in the knee-joint. The disease may originate in the synovial membrane, or in the bones entering into the formation of the joint. The former is termed synovial tuberculosis, and the latter osseous.

A. *Synovial Tuberculosis*.—This may be either primary or secondary, according to the original location of the disease. Three types of the former and two of the latter will be considered.

I. Primary Synovial Tuberculosis.

1. Diffuse thickening of the synovial membrane, or fungous arthritis.
2. Limited or circumscribed thickening of the synovial membrane, vegetating form.
3. Tubercular hydrops and empyema.

II. Secondary Synovial Tuberculosis.

1. Where the infecting depot opens directly into the joint cavity.
2. Where the infecting depot opens into the parasynovial tissue.

I. *Primary Synovial Tuberculosis*.—1. Diffuse thickening of the synovial membrane, or fungous arthritis. This is the classical "white swelling." On opening such a joint where the disease is well advanced, the skin and subcutaneous tissue are seen to be ischæmic; the capsule is thickened, softened, and of a glistening appearance; scattered throughout the line of incision are small and large clusters of tubercles, some caseating and appearing as yellow spots; the joint cavity contains a slight excess of fluid mixed with dead leucocytes, endothelio-epithelioid cells, and cell detritus, and the synovial membrane is wholly or in part covered by pale, flabby, fungous granulations. The articular cartilages are softened and honeycombed, and can be easily stripped from the underlying bone, which is the last of the joint structures to become involved in the tubercular process. Here the bacilli become localized in the subsynovial tissue, tubercles develop, and, by continuity of tissue, gradually involve the whole thickness of the synovial membrane until its free surface is reached, and the well-known fungous granulations form and ultimately fill the whole joint cavity. Before the free surface is involved, the active inflammatory changes, which in inoculation tubercle were seen to precede its development, set up a plastic syno-

vitis. This plastic synovitis, if the disease is progressing very slowly, may form partitions, as it were, within the joint cavity, and thus interfere with the proper application of intra-articular injections. It is this same preceding connective-tissue proliferation of the capsule, combined with the imbibition of fluids by the tissues, that gives the glistening appearance to the thickened capsule. The extent of this thickening will vary with the first location of the tubercles. If in close proximity to the free synovial surface, there will be less thickening of the capsule and a more profuse growth of granulations within the joint cavity. If more remote, there occurs a tubercular infiltration of the parasynovial tissues and increased thickening. It is in such cases that the sense of fluctuation is met with, and still little or no excess of fluid within the articulation. A similar condition may be found where the tubercles are very scanty or limited to a circumscribed area. In any case the whole synovial membrane is progressively involved. Retrograde changes set in, and are most marked always in the oldest tubercles; hence it is that the yellow spots—the caseating nodules—are found in the subsynovial tissues in greatest abundance, and not on the free surface.

2. Limited or circumscribed thickening of the synovial membrane, vegetating or tuberos form (Riedel and König). This is a comparatively rare form, and the diagnosis is made with accuracy only after the joint is opened. It consists of limited and circumscribed nodules projecting into the cavity of the joint, usually in the suprapatellar recess, or it may be more diffuse when the free surface of the synovial membrane becomes covered with a sessile or pedunculated papillomatous growth, with little tendency to caseation and softening. In the former some of the small nodules may become detached and wander free in the joint cavity, the so-called “rice bodies,” and give rise to an intractable irritative synovitis. These “rice bodies” are covered by a layer of fibrin, deposited on an intact covering, a derivative of the synovial membrane, and centrally consist of fibrous tissue, young connective tissue undergoing degeneration, and remnants of tubercles. The latter is similar in structure, with the exception that tubercles are plentiful in the vascular or attached part of the growth.

3. Tubercular hydrops and empyema (König and Volkmann). This is a synovitis with effusion of tubercular origin, aptly compared by Senn to a tubercular peritonitis. König, in examining cases of hydrops in an early stage, found a slight amount of chronic synovitis with a thin layer of tubercle on the surface, or a few tubercles embedded in the synovial membrane. The joint is distended with fluid, which resembles normal synovial secretion, or it may be viscid and contain small shreds of lymph. There is little or no thickening of the capsule. This also applies to empyema, where the joint is filled with tubercular pus; it is, as it were, converted into a tubercular abscess, and may attain an enormous size. The synovial membrane is here covered by a loosely adherent tubercular membrane, degenerating and caseating, and beyond this the tissues are infiltrated with

miliary tubercles. With the extension of the tubercular infiltration the cartilage becomes affected, and ultimately the bone. It is primarily a diffuse tuberculosis, the tubercles undergoing early retrograde changes, and this without the formation of granulation tissue. It runs a rapid course, and is met with in the two extremes of life.

II. *Secondary*.—1. Where the infecting depot enters directly into the joint cavity. (By infecting depot is meant a primary osseous one, which has by extension reached the articulation.) When the infection reaches the synovial membrane, tubercles rapidly develop, the endothelium proliferates, granulations form so that the surface of the synovial membrane assumes a villous appearance, and becomes later covered by caseating material. The parasynovial tissues also become involved in the inflammatory process, and undergo proliferative changes and imbibe fluid, so that the capsule becomes thickened and swollen from the oedematous condition of the fibrous tissue. The inner layer of granulation tissue does not cover the surface of the synovial membrane uniformly. It is most profuse around the point of communication with the osseous depot and at the points of reflection of the synovial membrane. The tubercular changes within the joint may be limited by a plastic synovitis which preceded the time of perforation. Thus may arise a partitioning of the joint cavity as already described. Careful examination of the cut margin of the synovial membrane will reveal two distinct layers, an inner, soft and easily rubbed off, and an outer, firmer and of glistening appearance. In the former bacilli are found; it corresponds to the centre of a single tubercle, while the outer is the area of active connective-tissue proliferation and is devoid of bacilli; hence, in operating, it is only necessary to remove the inner layer, leaving the outer intact, and thus can be obtained better functional result, through the minimized destruction of the capsule.

2. Where the infecting depot opens into the parasynovial tissue. In this case the osseous depot reaches the surface beyond the confines of the synovial membrane and within the capsule. The changes which then result are identical with those found in the diffuse thickening of the synovial membrane, or fungous arthritis.

B. *Bone Tuberculosis*.—Here the disease originates in the bone, and by extension of the tubercular inflammation into the joint cavity or parasynovial tissues involves the knee-joint secondarily. This is met most frequently in the young, before the obliteration of the epiphyseal line, when the anatomical arrangement of the blood-vessels favors the arrest of bacilli floating in the blood. This may occur as emboli or as a mural implantation of the bacilli on the vessel wall. Two forms of tubercular osteomyelitis are met with, first, with soft caseating depots, and, second, with necrosis of the formation of a bony sequestrum.

1. *Tubercular Osteomyelitis with Soft Caseating Depots*.—This is characterized by the presence of granulation tissue in the cancellated structure of bone, leading by degenerative changes to the formation of a caseated

nodule. The bacillus or bacilli reach the interior of the bone through the blood-vessels, become arrested, and set up their specific inflammation. The vessel wall is first affected, hyperæmia of medulla ensues, and around the point there occurs an aggregation of round, colorless cells containing a large nucleus, which F. Busch believes to be embryonal medullary cells, the product of tissue proliferation from the fixed myeloid cells. Thus granulation tissue is formed and the trabeculæ are absorbed. The tubercles multiply with the extension of the inflammatory process and caseation commences in the oldest part. Around the original focus, and where the irritation is less pronounced, there is formed a small amount of fibrous material with thickening of the trabeculæ, the results of proliferation of the connective-tissue cells and the osteoblasts. This forms the limiting zone if the process becomes arrested; if not, it is in turn invaded by the granulation tissue and absorbed. Thus the process extends until the surface of the bone is reached, followed by a tubercular periostitis or synovitis, according to the location. In the case of the former, a tubercular abscess will develop, and in the latter, an intra- or parasyndovial tuberculosis.

Examining the bone in a well-marked case, the depots will be found to vary much in size and color. They are usually small and situated close to the articular cartilage or surface of the bone. The color varies with the duration and extent to which retrograde changes have progressed. In the earliest stage, they appear as grayish-red granulations, yellowish red with commencing caseation, and yellow where complete, giving the well-known cheesy mass. This cheesy mass may feel gritty from the presence of small unabsorbed particles of bone where the progress of the disease has been too rapid to allow of complete absorption of the bone by the granulation tissue. The cheesy nodules may be multiple or single, and occur simultaneously in the femur and tibia. Around the caseating focus will be found a condition of progressing tubercular infiltration. Beyond this, the trabeculæ of the bones are thickened, the normal fatty tissue is absent from the cancelli, and is replaced by a swollen, fibrous, vascular material resembling somewhat the gelatinous infiltration present in synovial tuberculosis; and surrounding the whole, an osteoporotic condition of the bone exists.

2. *Tubercular Necrosis, or Formation of Bony Sequestra.*—In contrast to the molecular death of bone in the preceding, there is death of a fragment of bone of considerable size. The sequestra are larger than the soft caseating depots, and vary much in size and shape. They may be quadrilateral, irregular in form, or wedged-shaped, the base of the wedge directed or even extending to the articular surface. From this latter fact, König believed that sequestration resulted from embolism, and termed and described it as a tubercular infarct. Cheyne holds that this view is erroneous, because the trabeculæ of the sequestrum are thicker and denser than in ordinary cancellated bone, thus indicating that it has been previously the seat of active growth, a fact quite irreconcilable with the embolic theory. He thus describes tubercular sequestration: As a result of the deposit of

tubercles in a certain part of the bone, there is inflammatory reaction in the neighborhood, and ultimately the formation of young vascular fibrous tissue in a considerable number of the cancelli of the bone. In these cancelli, thickening and new formation of osseous trabeculæ go on, and the process continues to extend at the edge. While the formation of fibrous tissue and sclerosis of bone is going on, the tubercular growth is also extending, and accompanying it is the reabsorption of the newly-formed bone. Caseation of the tubercular growth occurs, and there the absorption of the bone ceases, and thus we come to have a central patch of sclerosed bone, with caseous material in the cancelli surrounded by very vascular tissue and denser bone. By and by the process ceases to extend with the same rapidity, and then absorption of the connecting trabeculæ of bone, and ultimately complete detachment of the sequestrum may take place. Thus it is that the sequestrum is surrounded by a layer of granulation tissue, generally containing tubercles or tubercular infiltration, and beyond this a layer of sclerosed bone. The density of the sequestrum varies with the acuteness of the tubercular process. If rapid, there is less formation of granulation tissue and consequently less absorption of the new-formed bone, so that the sequestrum is hard, and even may be eburnated where it communicates with the joint. The reverse is the case with abundance of granulation tissue, it may be so friable as to crumble on pressure, or have a honeycombed appearance. Scattered throughout the trabeculæ are caseated nodules giving the sequestrum a yellowish color.

Symptoms.—Constitutional and local may be altogether absent or obscure. Patients with well-advanced bone or synovial tuberculosis of the knee-joint may continue to use the limb without any inconvenience, and may appear to be in robust health. Or, the first symptom may be failing general health, marked by anæmia, without any symptom pointing to commencing joint-trouble, and accompanied by slight evening rise of temperature. To this latter König attaches the greatest weight, even if the increase be only half a degree.

In synovial tuberculosis, the first symptom to attract attention is swelling, due either to effusion within the joint, thickening of the capsule, or parasyndovial exudation. The degree varies with the origin of the disease. It is most marked in hydrops and empyema, where it is due exclusively to effusion of fluid within the articulation. The patella is elevated, and the normal groove, present on either side of the bone with the limb in extension, is replaced by a prominence. Fluctuation is distinct.

Tubercular hydrops develops as a painless swelling without any apparent exciting cause. It is to be distinguished from a catarrhal synovitis by the persistent return of the fluid after removal by aspiration, or after active use of the limb. It is accompanied by no muscular contraction or displacement of the articular surfaces of the joints. The limited or vegetating form is often accompanied by effusion within the joint, and either free, pedunculated, or sessile nodules may be detected in the fluid, the result

of the proliferative disease of the synovial membrane and the deposition of fibrin thereon from the effused fluid. It is the presence of these fibrinous deposits which gives the cracking sound heard and felt in moving the joint. Further, the thickened synovial membrane with its fibrinous deposit may be made out as a localized swelling in the capsule.

These may be considered the milder tubercular affections of the knee-joint, but they can by gradual extension assume the diffuse form of synovial tuberculosis or the typical fungous arthritis. In the early stages of this form, the subjective symptoms are absent, or there may be some slight discomfort which directs attention to the articulation. On examining the joint, suspicious symptoms are slight fulness above, below, and on either side of the patella, which gives a doughy or elastic sensation to the palpating finger, due to commencing thickening of the synovial tissues, and care must be exercised not to mistake this for fluctuation. There is no effusion of any account into the joint cavity. There is at this period muscular fixation of the joint and a tendency to slight flexion of limb. The articulation is as a whole more bulky, and a feeling of stiffness may be complained of, although there is no pain on active or passive movement. With the further extension of the disease the fulness becomes more marked, flexion increases, and as the disease reaches the articular ends of the bones, pain occurs on movement, as also tenderness in pressure on either side of the patella. Pain is very variable, and is most marked in those cases where the fungous granulations are scanty. The skin, heretofore normal in appearance, assumes a paler color, and becomes glazed and coursed over by distended veins. At points where caseation is approaching the surface it becomes reddened and congested. There is likewise local increase of temperature, and with still further destruction of the extra- and intraligamentous structures flexion becomes more marked, and ultimately terminates in dislocation of the head of the tibia backward with rotation of foot outward. This flexion is due to the preponderance of muscular contraction in favor of the flexors as compared with the extensors, and is, according to Leucke, first adopted as a method of expediency to avoid limping, and, second, to minimize the pain. The limb left to itself, the flexor contraction leads to dislocation backward of the tibia and outward rotation of the leg, because the external hamstrings, acting at a greater distance from the axis of the tibia than the internal, draw the head of the fibula backward faster than the inner border of the tibia (Holmes). Accompanying these changes there is atrophy of limb and failure of the general health.

Coming now to cases where the disease originates in the bones at or near the epiphyseal line of either femur or tibia, pain is usually the first symptom to arrest attention. In children this is first manifested by a slight limp, and careful examination may elicit a painful pressure point over the epiphyseal line. As the disease extends, this painful pressure-point becomes more marked, and the position of flexion is assumed to avert as much as possible pressure on the articular ends of the bones. At this stage, with

the patient recumbent, the joint may be freely moved without exciting pain, but cannot be fully extended, because then the articular ends of the bones come into accurate apposition and exert pressure over the painful area. A further symptom is pain of a gnawing character in the ends of the bones, especially at night, and as the subcartilaginous lamella of the bone becomes involved, there occur the characteristic starting or jumping pains during sleep. The further progress of the case varies with the site at which the original disease reaches the surface. If intra-articular, a synovial tuberculosis, similar to that already described, develops; if extra-articular, a tubercular periostitis, indicated by an increase of tenderness on pressure; later, as the overlying tissues are involved, a dull red color of the skin, with a swelling of a doughy character, appears, and finally, in absence of operative measures, ulceration of the skin and discharge of tubercular pus, with or without bony fragments.

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*A STUDY OF THE DEGENERATIVE AND DESTRUCTIVE
DISEASES OF THE LUNGS AMONG THE INSANE.*

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IN studying disease of the lungs among the insane, I have found certain peculiarities in symptomatology which are conspicuous enough to attract attention, on account of their influence in modifying the course of the disease. In hunting for an explanation of these peculiarities, I have found additional light shed upon lung-disease in general and its pathology, as well as a clearer conception of the destructive and degenerative changes occurring in the lungs of the insane, and a better understanding of the nature of the processes involved.

Living with his patient gives one an opportunity to appreciate the relativity of all the conditions in his environment which may modify the

course of the disease, as well as, by their influence on the general organism, stimulate its inception. Again, by following your patient directly to the dead-room, the manifestations of his diseased condition gain a distinctive significance; while seeing many patients together, and in succession, renders conspicuous the relativity of conditions which are not ordinarily considered in connection with lung-disease.

This study is based upon twenty-five cases selected from sixty-three in which post-mortem examinations have been made, and in these twenty-five cases there were well-defined lesions of the lungs.

As stated in a former paper, on an analogous subject, the experience in hospital is similar to that in general practice, in that we rarely make a *post mortem* in which we do not find pleural adhesions; although these changes are not essentially connected with senility, but are more usually due to artificial conditions, such as exposure, overwork, alcohol, or syphilis; producing inflammation, hyperplasia, or arterio-sclerosis. The two latter conditions are most commonly the antecedents of lung-disease among the insane, hyperplasia being most active as a cause before thirty-five and arterio-sclerosis being the most conspicuous antecedent condition after middle life.

There are two types of destructive lung-disease among the insane,—the one represented by the persistence of a broncho-pneumonia which never becomes completely resolved, the disease progressing as a catarrhal phthisis to a fatal termination, with or without tubercular infection, and, if the latter, sometimes manifested in the miliary form, involving the brain, peritoneum, and intestinal glands, as well as the lungs; the other represented by a progressive hyperplasia of the parenchyma of the lung, gradually destroying the function of the organ by encroachment upon the vesicular area and lumen of the bronchioles; again, as the result of arterio-sclerosis, presenting a rigid inelastic tissue, with apparent fibroid increase, although the lung may be actually much shrunk in mass. Both the latter forms of degenerated lung tissue may and commonly do become infected with tubercle, not essentially, but because we always have the infectious material with us; while the conditions which surround this class of patients in hospital render them more liable to tubercular infection than they would be under ordinary domestic sanitary conditions at home.

The peculiarities which mark the progress of phthisis in the insane are the absence of pain and dyspnoea, the infrequency of cough, hemorrhage, and expectoration, and the general absence of symptoms referable to the lungs; our attention being first called to the case by progressive weakness, emaciation, elevation of temperature, and sweating. The course of the disease is also very greatly prolonged, as a rule, even after patients are put to bed, they sometimes continuing a merely vegetative existence for periods varying from three months to a year. Like such cases in private practice, the patient often rallies from an apparently moribund condition and gets up

and about again, able to be out of doors and to sustain a fairly comfortable existence.

I have been accustomed to attribute the apparent absence of what may be called the distressful symptoms of phthisis among the insane, partly to the mental reduction present in most of the cases, producing a lack of sensibility, and partly to the histological conditions which underlie the pathology of the disease, to which I will refer later on.

It will be seen from the preceding presentation that only one of these forms of phthisis is primarily destructive, and that the others are really degenerative changes, requiring the addition of the tubercular infection to change a degenerative into a destructive process. This I look upon as an important distinction, and, before going any further with the argument, I wish to present the clinical history and post-mortem findings in a case of each type, from our hospital records.

First, the catarrhal type. C. N., male, aged seventy-six years. When admitted, April 9, 1893, he had a cough, with more or less profuse expectoration. Under appropriate treatment his general condition improved, the cough and expectoration lessened, and he gained in weight. This condition of fairly good health kept up during the fall, but when winter came and he was compelled to remain in the house his cough came back. In the early part of December he went to bed, very feeble and with an elevation of temperature varying between 101° and 103° F., with cough and increased expectoration. There were subcrepitant and mucous râles scattered over both lungs, with rapid respiration, and pain over the right nipple. The cough increased and his strength failed rapidly. The temperature rose gradually to 104° , and he died in the evening of December 13.

I wish to note here that this patient, although a case of senile insanity, had undergone very little mental reduction.

At the autopsy the left lung was found to be adherent over its entire surface, and there was marked fibroid thickening at the base, involving the entire lower half of the lung. On section pus flowed from the smaller bronchial tubes and could be squeezed from the lung substance. The lung weighed twenty and a half ounces. The right lung weighed twenty-seven ounces. The lower lobe was congested, and on section presented the same physical characteristics as the left. This man had a record of an attack of lung-disease some time before admission, from which he did not entirely recover. He was also the victim of a chronic progressive cervical kyphosis.

The following similar post-mortem findings were obtained in a case of chronic stupid dementia which terminated in death from dysentery and in which there were no symptoms to call attention to the lungs. Pleural adhesions existed along the borders of both lungs anteriorly, laterally, and at the base adherent to the diaphragm. The left lung weighed seventeen ounces. It was nodular at the apex, and the upper lobe contained pneumonic patches and areas of cheesy degeneration. The lower lobe was deeply congested. The right lung weighed twenty-one ounces. The upper and middle lobes were nodular, and different lobules were more or less infiltrated with inflammatory products. The lower lobe was deeply congested and contained several small abscesses.

The following is the history of a typical case of the hyperplastic form of degenerative lung-disease, to which had been added tubercular infection, ending in destructive disease.

J. B., admitted December 3, 1888. No record of family history. He was born in Sweden and was a day laborer by occupation. There is no record of physical disease at the time of his coming into the hospital. It is noted, however, that he was very stupid, sitting about with stooped shoulders and bowed head, taking no exercise, and after two years having to be led to and from the table or bed and cared for personally by the nurses. In the spring of 1891 he had a severe hemorrhage, apparently from the posterior nares, from the effects of which he recovered in about a week. From this time on his physical condition improved, and he became brighter and more vigorous. In the summer of 1892 his physical condition again became impaired and he had a phlebitis in the right leg, making him quite lame for a while. From this time on he grew steadily weaker and more stupid, assuming his previous stooped attitude in even a more exaggerated form. He had an attack of epistaxis in the winter of 1893, after which he failed more rapidly until he was put to bed, July 8. Up to this time there had been no symptoms to call attention to the lungs, but after he went to bed there were the usual physical signs of progressive tuberculosis of the lungs. However, there was no cough, very little expectoration, and no subjective symptoms. He died July 31, 1893.

The autopsy disclosed pleural adhesions on both sides posteriorly, and on the left side anteriorly and inferiorly. Both cavities contained considerable fluid.

The right lung weighed forty-three and a half ounces. The whole surface was covered with nodules, most marked in the upper lobe. The apex was consolidated and contained several small cavities. The lower lobe was fibrous and contained areas of cheesy degeneration. The left lung weighed forty-three ounces and presented the same physical characteristics.

The following are the post-mortem findings in a comparatively similar case. J. C. J., died February 5, 1894. The left lung was slightly adherent at the apex, and the right at the base. The left lung weighed fifty-one ounces, the right forty-three ounces. The surface of the left lung was covered with fibrous patches, which were so dense as to make the lung substance cut with difficulty. On section the whole lung was found studded with tubercles, mostly small, but a few larger ones, caseous and breaking down. The apex was only slightly involved. The right lung was more fibrous and solidified, with fewer tubercles. In another case included in this study the right lung, which contained two gangrenous abscesses, weighed sixty-seven ounces, while the left lung weighed twenty-three ounces and was slightly hyperplastic at apex and base.

The following case approximates as closely as may be to the interstitial or arterio-sclerotic form of degeneration, although the final cause of death was tubercular infection :

G. H., admitted in 1887, had been a terminal dement for three or four years. In September, 1892, he began to lose in weight and strength and was put to bed. He failed rapidly from this time on, with rapid respiration and pulse. There was no pain, no cough, and very little expectoration. He lapsed into unconsciousness and died in the night of September 10, 1892.

The autopsy revealed the following conditions in the lungs: The pleura was

adherent at the apex of the right lung and to the diaphragm in two places. The right lung was very small and filled only a small portion of the chest cavity. The upper lobe was particularly small, and a small area at the apex was emphysematous. The middle and lower lobes were collapsed and solid. They contained several tubercular nodules, which were partially broken down and contained pus. The left lung was small but in better condition than the right, and there were no nodules present.

The following table shows the relative frequency of the different forms of degenerative lung-disease in the cases studied, and the nature and location of the diseased condition :

	Case number.	Both lungs.	Increased density alone.	Increased density with cavities.	Increased density with cavities and nodules.	Increased density with nodules alone.	Shrunken lung with consolidation alone.	Shrunken lung with nodules.	Shrunken lung with cavities.	Cavities and nodules at apex.	Cavities and nodules in other lobes.	Cavities throughout the lung.
Catarrhal or pneumonic form.	17	1	1	...	...	...	...	...	...	...	...	...
	1	...	...	...	...	...	...	...	...	...	...	1
	5	...	...	...	...	1	...	...	...	...	...	...
	2	...	...	1	...	...	...	...	...	1	...	...
	6	1	...	...	1	...	...	...	...	1	...	...
	20	1	...	1	...	...	...	...	...	...	1	...
	22	1	...	1	...	...	...	...	...	...	...	1
Hyperplastic form.	25	...	...	...	1	...	...	...	...	...	...	1
	12	1	...	...	1	...	...	...	...	...	...	1
	13	1	...	...	1	...	...	...	...	...	...	1
	16	...	...	...	...	1	...	...	...	1	...	...
	18	1	...	...	1	...	...	...	...	1	...	...
	23	...	...	1	...	...	...	...	...	...	...	1
	24	...	...	...	1	...	...	...	...	...	1	...
	7	...	...	...	...	1	...	...	...	1	...	...
	8	...	1	...	...	...	...	...	...	...	...	...
	9	1	...	...	...	...	...	1	...	1	...	...
Interstitial or arterio-sclerotic form.	10	1	1	...	...	...	...	...	...	...	...	...
	19	1	...	1	...	...	...	...	...	...	...	1
	3	...	...	...	...	1	...	1	...	...	...	...
	4	1	...	1	...	...	...	...	1	...	1	...
	11	...	...	...	...	...	1	...	...	...	...	...
	14	1	...	...	...	...	...	1	1	1	...	...
	15	1	...	...	...	1	...	...	...	...	1	...
	21	...	...	...	...	1	...	...	...	...	1	...

The most conspicuous element in this table is the disproportionately large number of cases of the hyperplastic form, and these we always find in those individuals who are the victims of primary mental degeneration. The next and most important point, from the stand-point of morbid anatomy, is that seven of the cases had cavities or nodules at the apex, while twelve had cavities in the other lobes or throughout the lung. The most common seat of cavities and nodules in the lungs among the insane is in the middle lobe in its posterior portion. It is interesting to note that in the interstitial or arterio-sclerotic form the only cavities present were in the middle lobe, while

the apex was in varying degrees emphysematous. The catarrhal form gives the smallest number, and this because the conditions which give rise to broncho-pneumonia are less common than in general practice.

The weight of the lung varied from fourteen ounces to sixty-seven ounces, and one case presented, as you have seen, a right lung weighing fifty-one ounces, while the left weighed forty-three ounces.

I will pass over the cases of pneumonic phthisis, because their pathology does not differ very much from that of similar cases in private practice, the main difference being that pain, dyspnoea, cough, and expectoration are not present to anything like the same extent found in general practice, and, as a rule, are all absent except in the very last stage of the disease.

The second or hyperplastic form of lung-degeneration is the most interesting, not only on account of its greater prevalence, but because it is most characteristic of degenerative disease in the insane. The victims of this form of lung-degeneration are generally between twenty-five and forty years of age; although the time at which the hyperplastic process begins can seldom be definitely determined, as it often happens that the individual patient may remain in apparently robust health to within a few weeks of his death, when he breaks down rapidly and dies suddenly from miliary tuberculosis in its acute form, the subacute form, or the more slowly progressive formation and destruction of caseous nodules, with abscess and cavities. These abscesses are, as a rule, small and to a great extent scattered throughout the lung. Two of the cases included in this study suffered from pulmonary gangrene: the one following an acute pleuro-pneumonia, the other due to thrombosis of pulmonary vessels.

The pathology and morbid histology of this hyperplastic form of lung-disease is especially of interest, because it explains why phthisis may exist for a long time without the tubercle bacillus being active or any destructive changes in the lung-tissue take place. During adolescence or early adult life, in all cases of primary mental degeneration, there is a constant tendency towards angeio-neurotic manifestations, with stupidity, sluggish circulation, cold and oedematous extremities, and aversion to muscular effort. Impaired appetite and constipation are almost always present, and these people lead inactive lives, sitting about in a stooped position, with bent heads and general muscular relaxation. The skin is cold and moist, the pulse feeble and generally slow. Their stooped position and muscular relaxation make their respiration almost entirely diaphragmatic, and in this way partially account for the hypostasis of blood in the lower lobes and the comparative freedom of the apices from disease. These people may live along in this way for years, a purely vegetative existence, sometimes dying of some acute form of bodily disease or of exhaustion from failure of trophic function, and post mortem nothing be found in the lungs but increased density due to hyperplasia of the parenchyma of the organ. These individuals often suffer from acute broncho-pneumonia, and sometimes make astonishing recoveries, as shown in the following case record.

C. M., a terminal dement, profoundly stupid, filthy, utterly inactive, was found sitting on a bench, one day in July last, with flushed face, rapid respiration and pulse, and a temperature of 106° F. He was put to bed and soon became stuporous, the temperature coming down to $104\frac{1}{2}^{\circ}$ in the next twenty-four hours. The physical signs indicated the presence of a severe broncho-pneumonia involving both lungs. There was no cough, however, and practically no expectoration. The respiration became more labored and shallow, the exhaustion and stupor more marked, and the temperature varied between 103° and 105° . The patient took very little nourishment and was apparently *in extremis*. This condition continued for about ten days, when he gradually began to improve, the temperature going down slowly and the lungs gradually clearing up. At no time was there any cough, and the amount of expectoration was practically *nil*. It is worth noting that, shortly before this time, the patient had just recovered from a severe attack of erysipelas of the leg. There was some emaciation for a time after this illness, but the patient soon returned to his normal condition of stolid stupidity, interrupted only occasionally by outbreaks of destructive violence. In time, under the influence of some depressing condition, the tubercular disease will begin in his lungs, and he will finally die from the progressive asphyxia dependent upon increasing destruction of lung-tissue.

Another important consideration in these hyperplastic cases is the presence of similar change in the other vegetative organs, which by its presence proves the process to be a degenerative one involving the whole organism, and dependent upon imperfect development. The following table will show the frequency and location of the hyperplastic change in the other organs. The only patient in whom this change was absent was a girl of nineteen years dying of miliary tuberculosis.

Case number.	2	6	20	22	25	12	13	16	18	23	24	7	8	9	10	19
Heart	1	1	..	..	1	..	..	..	..	1	..	..	1	..	1
Liver	1	1	1	1	1	..	1	1	1	..	..	..	1	..
Spleen	1	1	1	1	1	..	1	1	1	..	..	1	..	..
Kidney	1	1	1	1	..	..	1	1	1	1	1	1	1	1	..
Stomach	1	..	..	..	..	..

The pathology of hyperplasia of the lung is, so far as we can judge by the microscopical appearance of the diseased lung-tissue, a persistent hyperplerosis, brought about by the habits of the individual, especially the muscular relaxation, stooped position, and restriction of movement in the lower part of the chest wall. This is followed by a true hyperplasia of the parenchyma of the lung, gradually encroaching upon the alveoli, lessening the capacity of the infundibula and the lumen of the bronchioles. At the same time the blood-vessels have gained a greater protection, and consequently when the lung breaks down hemorrhage is not likely to occur, because, from the nature of the change, nodules and cavities will be small and multiple, and the walls of the blood-vessels will not be eroded. The location of the hyperplastic change is of course determined by the position habitually assumed by the patient and his inactive life, and these account for the location and size of the nodules and cavities found in this class of

cases. It is worthy of note that in all these hyperplastic cases where nodules and cavities are found at the apex, the patient has led a fairly active life, and the density of the lung is not so much increased.

The interstitial form represents atrophy from impaired nutrition due to arterio-sclerosis, and is found after middle life. Here impaired nutrition causes atrophy of the parenchyma of the lung, with shrinkage and apparent increase of fibroid tissue. The infundibula are decreased in size, the walls of the bronchioles are hardened and their calibre lessened, and the smaller bronchi become hardened and often covered with calcareous patches. These lungs often have partially collapsed lobules, and sometimes even a whole lobe may be collapsed, with emphysema at the apex, as noted in one of the cases used in illustration. Often, however, the lobes remain intact though shrunk, and the whole surface of the lung assumes a distinctly lobulated form. Singular exceptions to these changes sometimes occur, and we find sound, healthy lungs when the brain and every other organ is more or less diseased, and I have found these healthy lungs most commonly in general paresis.

My experience in the study of the morbid anatomy of phthisis among the insane makes me a firm believer in the validity of the claim of Sir Andrew Clark, that there is phthisis without tuberculosis. I also believe that the tubercle bacillus may be present for a long time without setting up any destructive change. This belief is founded on the following observations. I have found the tubercle bacillus in lungs where no destructive change had taken place, and where the patient had died from some other disease, such as cerebral hemorrhage, nephritis, or pneumonia. I have also found lungs with small cavities due probably to the shutting off of a lobule, as the result of plugging of the bronchiole, no bacilli, the contents of the cavity undergoing absorption and its walls organization. Often the change in the lung-tissue presents to the eye a fibrous triangle, its rounded base being a fibrous line on the outer surface of the lung. Sometimes this mass contains a small cavity filled with caseous material, or a calcareous mass of the size and shape of a Lima bean. Again, the lung, generally in its upper lobe, is scarred and seamed, showing the remains of destructive change, which, beginning probably as a hyperplasia, has partially broken down, but finally, under more favorable conditions of nutrition, has become organized, contracts, and assumes the distorted scar-like shape referred to.

In those cases which assume the broncho-pneumonic form and in which phthisis follows the unresolved lobular inflammation, the tubercle, being shut up in an isolated lobule and finding in the excessive secretion an excellent culture medium, multiplies rapidly and sets up a destructive change involving the mucous membrane. Now, if there are none of the ordinary pus-producing bacteria present, the bacilli die of inanition, because all the nutritive material is used up. The contents of the cavity, as a result of aseptic retrograde change, become finally a caseous mass. However, it is seldom in this form of disease that all communication with the outside is

cut off or that the tubercle bacilli alone are locked up in the lobule. Then, too, these masses are seldom isolated, and a number of them communicating convert a physiological retrograde change into a pathological one, the result being an abscess-cavity. This process is probably carried on in the arterio-sclerotic form of degenerative lung-disease in the same way, the difference in the location of the cavities, symptoms, etc., being due to causes which have been before described.

In the hyperplastic form, as I have observed it, the process is entirely different. Here there is a progressive increase of the density of the lung existing for a comparatively long period, with the constant deposit of formative material in the parenchyma of the lung and the chronically increased mucous secretion which necessarily results. The tubercle bacillus may exist in this medium for a long time, but, unless it penetrates the mucous membrane of the alveolus, it will do no harm, because the hyper-nutrition prevents its multiplication by destroying it, and this is well shown when one of these individuals, with the above-described conditions present, begins to improve mentally. He becomes active, goes out of doors, takes up with some occupation, and soon all signs of lung-involvement disappear, as the result of normal lung-expansion, with the concomitant circulatory and lymphatic stimulation. However, as is more often the case, degenerative change progresses, exposure, exhaustion, or acute bronchitis lowers the vitality of the individual suddenly, the resistive power of the new-formed tissue and formative material is lessened, and the bacillus invades the lung. Its behavior is, however, very different. The natural mucous secretion is no longer its pabulum, but the plastic formative material underneath. Here small tubercular masses form, which may be scattered throughout considerable portions of the lung, and, as is often disclosed post mortem, they may remain discrete, or they may coalesce into nodules of different sizes, and, if these nodules becoming connected with a bronchiole are exposed to further attacks of causes of suppuration, they break down. However, we often find along-side of such a suppurating nodule another which contains nothing but comparatively dry cheesy material.

Now, in proportion to the length of time this hyperplastic change has been going on will be the diffusion of this process and the number and size of the cavities, the increased amount of formed connective tissue and the constant supply of formative material necessarily prolonging the process and limiting the size of the cavities.

VAGINAL HYSTERECTOMY.¹

BY WILLIAM J. GILLETTE, M.D.,

Of Toledo, Ohio,

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VAGINAL hysterectomy is practically of recent date, though, according to Greig Smith, it was performed before the Christian era for prolapse; but it seems there is no account of its having been done at that early date for other diseases. The operation, however, fell entirely into disuse until the year 1813, when it was again brought forward. In that year Langenbeck removed the uterus by enucleation for supposed cancer. When the success of Langenbeck's operation became known, a number of surgeons, both French and German, performed it; but with such poor success that it was again abandoned until fifteen years ago, when Czerny took it up, in hopes of finding a desirable substitute for Freund's abdominal hysterectomy, which had had such a high death-rate as to render its performance no longer justifiable. Through the labors of Czerny and others, vaginal hysterectomy was made a recognized surgical procedure. The mortality, to begin with, like that of all major operations, was very high; but the fact has been gradually established that the operation is no longer a dangerous one, at least when performed by competent hands and upon suitable cases. The fact that vaginal hysterectomy in skilled hands can now be done with so low a death-rate has, no doubt, led European surgeons to adopt it for other diseases than that of cancer. Dr. R. Stansbury Sutton, of Alleghany, Pennsylvania, in the *New York Medical Journal* of November 3, 1894, says: "Péan, in 1891, began operating successfully through the vault of the vagina for inflammatory disease of the pelvis, as well as for new growths in that region. Following him have come Segond, Jacobs, Sanger, Leopold, Landau, and others, whose reports are equally flattering. The day has gone by when we can longer afford to adhere to laparotomy for pelvic diseases and tumors growing from the pelvic organs, and still young or still occupying the pelvis, or even the lower abdominal cavity. Why remove the uterine appendages and leave the infected uterus? Why embed ligatures in infected tissues, to be subsequently the centre of exudates or pus-cavities? Why leave in the peritoneal cavity the infected stumps of infected tubes? Why run the risk, by the old conservative laparotomy of Tait, of faecal fistulæ, returning ligatures, and ventral herniæ? Is the infected uterus

¹ Read before the Tri-State Medical Association, December 11, 1894, at Hillsdale, Michigan.

worth saying at such a cost? Jacobs tells me that in not a single case of total extirpation has there been a troublesome sequela. Can we say anything like this for laparotomy?" Dr. Sutton may be over-enthusiastic; but surely if the uterus, the tubes, and the ovaries can be removed together *per vaginam*, as he claims for Jacobs, with a death-rate of only 1.4 per cent. in a series of one hundred and forty cases, a distinct advance in pelvic surgery has been made. The time will soon come when this radical procedure may be adopted by the average surgeon, although to-day the removal of the uterus by him, even in uncomplicated cases, is a formidable procedure. When surrounded by adhesions connecting all the pelvic viscera, as is so commonly the case with pus-tubes, the successful performance of vaginal hysterectomy, in the present state of our knowledge of its technique, is almost an impossibility. In a case of cancer in my own practice, on which I operated and found such a condition of affairs as above stated, I found the operation exceedingly difficult, and, unfortunately, followed by a fæcal fistula, which, however, completely closed in a few weeks. For a time I nearly despaired of my patient's life. Fæcal fistulæ are certainly not common after laparotomy, for, after making more than one hundred sections, I have had but one. It is quite evident that if we are generally to obtain such results as Jacobs and others, we must know more accurately their technique. The value of their work will, however, be almost unquestioned, for in all cases of removal of the ovaries and tubes, or at least in the great majority of cases, we would prefer to remove the uterus with them if we could safely do so. I think this is the opinion of all surgeons who have had much experience with pelvic surgery. In all probability the time is near at hand when it will not be considered good surgery to do other than remove the uterus with its appendages; whether this will be by the vaginal route or by abdominal section is yet a question. The vaginal operation is, no doubt, the operation which will be selected.

My cases of vaginal hysterectomy, few in number, have all been performed for cancer, and have all recovered. Usually for hæmostasis I have used the clamp, though, where the uterus has been fixed or could not readily be brought down, I have used the old method of clamping the broad ligaments with long forceps. I am quite well aware that some surgeons have abandoned both clamps and forceps, and use only ligatures; but I have never felt safe with the exclusive use of the latter appliances. Whether Kraske's operation of removing part of the sacrum to more readily reach the broad ligaments, when these are invaded with cancer, will prove an addition of practical value to our resources, is an open question, though it certainly allows the operator a much better view of the field of operation. It would seem, in those cases in which the broad ligament is involved, to be a simpler and safer procedure to remove the uterus by abdominal section, the operation being performed with the patient in the Trendelenburg position; in fact, the Trendelenburg position is here a *sine qua non* of success. Such operations as Suchardt's, Wolfier's, and Zucherkanl's are not additions

of value. Vaginal hysterectomy is much to be preferred to the older operations of Baker and Hegar. In a case of my own, in which I amputated the cervix high up, supposing at the time that the disease was completely removed, microscopic examination by the pathologist of the Toledo Hospital, Dr. D. Haag, showed the tissues last removed and farthest from the principal point of the disease infiltrated with cancer. In a few weeks I was compelled to remove the entire uterus, which I should have done at first, not submitting my patient to the increased dangers of a second operation. I have since insisted upon removing the entire organ in all cases, or else I have let the case severely alone. The operations of partial amputation of the uterus are operations of the past. When we come to investigate the statistics of recurrence after hysterectomy for cancer, we open up a sad chapter of medical history. After removal of the breast for cancer we can expect a cure in at least from twenty to thirty per cent. of cases. After hysterectomy for cancer, however, when the disease has begun in the cervix, we can expect only from fifteen to seventeen per cent. of recoveries. In one case of cancer of the uterus of mine that had gone almost a year without recurrence, the cicatrix at the end of eleven months appearing perfectly healthy, scirrhus has developed in the breast. In cases of this kind it does not seem possible that the disease could have been carried from the uterus. If we cure fifteen cases out of one hundred, Fritsch speaks truly when he says that we might also have cured the other eighty-five had they received timely treatment. I believe that the general practitioner should more fully recognize this fact than he evidently does at present, and should more fully recognize his grave responsibility when patients in the earlier stages of cancer present themselves to him. No better evidence of his lack of appreciation of such responsibility, to my mind, exists than the statement of patients, continually referred to the gynecologist far advanced in the disease, that "Dr. So-and-So has done all he can for a number of months past, but has now concluded that an operation is necessary." If the rule was strictly followed to refer cancer at the earliest date possible to the surgeon, we could hope for much better results than are now obtained; and, too, if the surgeon would refuse to operate when the disease has invaded the tissues outside the uterus to any extent, we might hope for better statistics concerning the ultimate result. It is true, however, that often the physician first observing the case is not at fault, for many patients have cancer far advanced before they come under observation. It has been my own experience and that of the profession at large that in the incipient stage there are but few symptoms calling the attention of the patient to the fact that there is something seriously wrong. We should insist always upon making an examination of a patient coming to us with the statement that she has a bloody, serous discharge, whether she has pain or not, and we should not put such a patient off with a little ergot, or some local astringent solution, hoping that everything will be all right. With the least suspicion of cancerous disease, the case should be submitted to a competent microscopist for accurate diagnosis,

and severely should the practitioner be criticised if, suspecting the case to be cancer in the incipient stage, he resorts to local applications, letting the time for complete cure go by with his almost criminal tinkering.

In conclusion, my reasons for writing this paper are two: first, to call attention to what seems to be a fact, that vaginal hysterectomy is soon to be performed generally for other diseases than cancer, and may largely take the place of laparotomy for diseases of the pelvic organs; second, to remind those seeing uterine cancer in its early stages of their grave responsibility.

CLINICAL LECTURES.

NEURALGIA.

POST-GRADUATE LECTURE DELIVERED AT THE NATIONAL HOSPITAL FOR THE PARALYTIC AND EPILEPTIC, ON THURSDAY, NOVEMBER 22, 1894.

BY W. R. GOWERS, M.D., F.R.S.,

London, England.

TO-DAY, gentlemen, I propose to ask your attention to a disease that you are certain to meet with, and certain to find among the most formidable, the most difficult, and even the most distressing of the practical problems with which you have to deal. The patient before you is suffering from senile neuralgia of the fifth nerve.

The mystery of pain presses upon our life on every side. It presses upon us in all our work, in every branch, but nowhere in such pure intensity and penetrating character does it tax our energy and baffle our resources as in that which is called the disease of pain, "neuralgia," "nerve-pain," because, in its special form, the pain is associated with some single nerve, as is that which is before us to-day. The prefix "nerve" refers to the limitation of the pain, and the name indicates the real character of the malady as a pure *disease of pain*.

The part which pain plays in life is varied, but for it we should be, on the whole, thankful. Pain is essentially a warning of that which is worse than itself. It is a warning which incites escape from the coming evil of which it is the shadow thrown before. Without pain no life could long endure. Without the warning which pain gives, various influences by which life would be ended could not be perceived in time for its preservation. The great office of the sensory nerves which the human and animal frames possess in such abundance is to give indication of that which is external to the organism. It is to permit the outer world to act upon the nervous system,

and through the nervous system to enable the organism to act upon the outer world. Through the sensory nerves all knowledge comes; through the sensory nerves all guidance is afforded, and through them all warning of evil is obtained. The great agency of warning is pain. Without pain, without that which is incongruous, unpleasant in various degree, from the slightest discord to the intensity of agony, there could be no adequate escape from that which is injurious.

Yet it is scarcely correct to describe the influence of the external world as influence exerted through the *sensory* nerves. The accurate phrase would be that it is exerted through the *afferent* nerves, through the nerves which conduct impressions to the central organs and by the agency of the central organs exert adequate effects upon other structures. We are sensitive, sensitive enough. We have more than enough of the impressions which acting upon and through our nerves reach consciousness. We may be thankful that there are no more. But, as a fact, it is probable that the afferent impressions which act upon consciousness are not more than one-tenth of the total amount of impressions which act upon the centres. Consider for a moment, as I have more than once asked students to do, how much of which we are unconscious we may become conscious of. Consider at this moment how from any part of your frame you may become conscious of sensory impressions which before you were wholly unaware of. I have sometimes asked a class of students to fix attention upon the vertex of the skull and note if they did not observe a distinct sense of pressure there, and I have been invariably successful in the result. I confess, however, it has been at the end of my lecture, and not at the beginning. Therefore I am doubtful whether, at this moment, the effect will be sufficiently definite to justify my request. But the impressions of which we may become conscious by attention are but a small proportion of those which are forever passing to the central structures from every part of the frame, and the reality of this is shown by the fact that when intensified they are perceived as pain.

Consider the significance of the pain of pleurisy, of peritonitis, of inflammation of the serous membranes. There is agony most intense, spontaneous, and produced by the slightest mechanical stimulus. The path for those sensations must exist, and must be always a path of actual impressions, although they never reach our consciousness in normal states. This reserve, as it may be termed, of capacity for pain seems true of every structure, and everywhere we must conceive its significance to be the same,—that impressions in health are forever passing along the afferent nerves, impressions produced by varied processes of movement in the blood-vessels and perhaps the processes of nutrition, but impressions also which have their reflex influence in guiding the other subsequent processes (as from the muscles) related to those from which they result, but which never reach our consciousness. Yet there we have the faculty, the capacity for pain, as an ever-present potentiality in every structure and in every tissue, in general a safeguard against harm, harm of disease or harm of injury,—and in disease demand-

ing, with a voice that cannot be unheard, the needed rest. Yet this, by morbid action, may be developed to a disaster. The excessive development of the higher functions of the nervous system, which comes with civilized life, must, it would seem, entail an excess of the guarding capacity for pain. Consider the influence, through generation after generation without number, of an existence which we cannot conceive as really natural, at least if we look at the life of the red Indians, or of other races whose habits conform to the general relations of their organism. Civilized life, that is a mode of existence quite out of harmony with our animal frames, must entail disproportionate development and elaboration of the parts of the system on which it specially acts. It must, of necessity, develop this danger-signal of pain into a degree of intensity and readiness of excitation which makes it at last one of the grave evils of life.

Of that result we have the most conspicuous instance in neuralgia of the fifth nerve. This, surely, is natural. Consider what the fifth nerve is. I have alluded to pain as a warning, a mode of guardianship. Guardianship is needed in proportion to the preciousness of that which has to be preserved. The capacity for guardianship is proportioned to the readiness with which warning is produced, and to the effective degree which it readily attains. When we consider what the fifth nerve is and what it has in its charge, can we wonder that in this we have sensitiveness to pain raised to the utmost degree and developed to the potentiality of disease? Within its charge are the chief organs of special sense: the organ of sight, with all its marvellous delicacy of structure; the organ of hearing, hardly less elaborate; the organ of smell, with its relation to the entrance of air; and, lastly, not only is the organ of taste within the charge of the nerve, but the nerve-fibres of the fifth nerve, so far as its root is concerned, are actually the channel by which impressions of taste reach the brain. The nerve has thus in its care the chief avenues for knowledge, and it has also within its guardianship the avenues by which matter, and all the energy that matter bears, enter the system,—the opening of the alimentary canal and of the air-passages by which the oxygen passes to the system without which the food could have no influence. It is the guardian, as it were, of the gates through which enters that on which life depends and by which its power is supplied. It is, therefore, no matter of surprise that its functions should reach a perfection, a capacity, which render it above all other nerves prone to disorder.

In considering pain as a symptom of disease it is important to remember how much all our conceptions are colored, and how their form is determined, by our sensations. Consider the absolute distinction which we make between light and heat. We think of them as totally different things; and yet it is a fact that the undulations of light in the red end of the spectrum which are perceived by the eye as red light are absolutely the same as those which are felt by the skin as heat. It is not that the heat and light coexist at the red end of the spectrum: they are the same. We

give them different names simply because we have structures that respond to them in different parts and of different characters. As our sensations seem to us so different, the causes of the sensations seem to us utterly unlike.

That which is true of kind is often true of degree. As we regard the same influence as different because its effects are different, so we regard influences as great or small as their effect on us is considerable or slight. There is no necessary proportion between the intensity of pain and the degree of the impulse which causes it. There seem to be special nerves through which pain is normally produced, which we call "nerves of common sensation." But there is evidence that by many other nerves pain may be caused, if the impulse which when in moderate degree gives rise to another sensation reaches an intense degree. In the nerves of "common sensation," the nerves of pain, a most intense sensation may be produced by a trifling influence. Conceive what may be taken perhaps as a minimum of nerve-impulse, the instance which I gave in a recently published address, the lightest touch of a hair upon the skin. Conceive the actual amount of energy constituted by the nerve-impulse to which that gives rise, which nevertheless passes up to the brain and produces its definite effect. As I have said, to conceive it you must attenuate your ideas of energy to atoms. In the nerves of pain it is probable that intense pain may be produced by a nerve-impulse scarcely greater in actual dynamical amount. It is important to realize this, because it enables you to understand why the morbid process to which neuralgia is due should so often escape detection, should indeed be beyond our present discernment. We have another illustration of it in the neuralgic pains of tabes. In a case of absolutely stationary tabes, with degenerative changes of the peripheral parts of the sensory nerves, there may occur from time to time, through years, paroxysms of agonizing intensity, and yet through all those years, with these attacks of pain coming and going, there is, as far as every other evidence can show, not the slightest increase in the disease. The changes in the extremities of the sensory nerves suffice to cause intense pain from the impulses which pass upward, impulses which may be an intensification of such as should be unperceived or may be produced *de novo*. How slight may be the difference in the character of the impulse which passes up unfelt or causes pain may be shown by this, that a mere change in the weather will cause an attack of intense pain.

As a matter of fact, in most cases of neuralgia of the fifth nerve, such as that which I am about to show you, no organic lesion has been found. It is a matter which is still uncertain. Facts can come but slowly to tell us whether most cases of persistent neuralgia of the fifth nerve are due to a peripheral or a central cause. It is most difficult to discern evidence one way or the other from the symptoms themselves. Among the facts that we have learned which seem of clear significance, there is the fact that disease of the centre of the fifth, in the pons, may give rise to such pain, that disease of the fibres in their course, perhaps also in the Gasserian

ganglion, may give rise to such pain, and that disease of the peripheral termination of the fibres may give rise to such pain. It is important, in connection with the conception of the pathology of neuralgia, to realize the fact that the nerve-fibres which conduct differ only in degree from the structures which generate the nerve-impulses. I have elsewhere laid great stress upon this fact. It has been brought out by recent discoveries regarding the structure of the gray matter of the nervous system. These discoveries have an important bearing upon almost every problem of disease. The nerve-fibres, those for instance of the fifth nerve which reach in the pons and disappear from perception in the spongy substance of a long column of gray matter, probably end in that substance by terminations slightly thickened, it may be, but absolute. We used to say, we used to think, that the nerve-fibres end in the cells of the gray matter. The cogency of the facts which have been brought forward prevents me, for my own part, from entertaining any doubt of the correspondence of the new statements with fact. We must conceive that from the cells of the nucleus of the fifth nerve branching processes go off which end by contiguity, but not by continuity, with the ends of the fibres that conduct. We must conceive that the impulses which pass up leap in some way from one to the other. I say "leap," but it may be that the most powerful microscope would not reveal the chasm over which they leap. Yet it is absolute; a break in the molecular continuity which permits the passage of chemical action. The leap is probably by simple motion, like that which produced the impulse in the first instance at the periphery, where branching processes of the cells (that is, of the long fibres) end or begin in slightly enlarged terminations in the skin.

I spoke of "branching processes," but I should rather say "separated fibrils." I need not go into that distinction, although it is one of fundamental importance, because it is explained fully in an address I have lately published, and in which these facts and opinions are readily accessible to you.¹ Remember how extremely complex is the spongy structure of the gray substance in every nerve-nucleus; that we have innumerable fibrils in close relationship, and among these there must be terminations which constitute definite paths in the closest contiguity, so that impulses readily pass from the one to the other. Others must be sufficiently near for an energetic impulse to pass between them, but not for a slight impulse in the closest, and among these we can readily understand that there may be a difference in special excitability at the time. An impulse may even reach the centre and excite an adjacent fibril ending more readily than the ending which is in strict relation to it, because the former is the more excitable. If we conceive, as I think we must, that the nerve-impulse which begins by excitation from simple motion, which is propagated by chemical processes as a form of motion, may pass again as simple motion where the absence of continuity prevents the chemical transfer of its special form of

¹ The Dynamics of Life. London: Churchills; Philadelphia: Blakistons.

motion, it is not difficult to understand that adjacent fibrils may be thus excited, and that we may have what is called an "irradiation of sensation."

I remember a personal instance of that. Unpleasant as personal experience may be, never forget that the most useful knowledge of your professional life is that which is subjective. I remember having a carious tooth in the lower jaw, from which I suffered no pain. After a time I had an attack of recurring paroxysms of intense neuralgic pain in the upper jaw, just opposite the tooth, but never associated with any pain in the carious tooth. At last I had that tooth extracted. The process of extraction caused the most intense paroxysm of pain in the upper jaw that I had ever experienced, and—it was the last. There can be no doubt that the irritation of the inferior dental branch of the fifth nerve had in some way, probably by some increased susceptibility of contiguous fibrils, led to their special excitation, and their stimulation had reached a morbid degree, intensifying itself until it possessed the capacity for neuralgia.

These new facts of the relation of the nerve-structures do enable us to understand many phenomena better; and that which explains much is seldom wrong. We can sometimes discern truth most surely by perceiving how much that is obscure is made clear, how much that is discordant is brought into harmony, how much more we can look for than before could be conceived.

Among the many varieties of neuralgia which you will find arrayed in text-books in serried ranks of formidable length and imposing order, three groups are specially important: (1) The neuralgic pains which occur at all periods of life from definite local irritation, such as that which decayed teeth induce. (2) The changing neuralgic pains that we meet with especially in middle life,—when a neuralgic pain comes in one part, then passes to another, then may leave and go to a third, then perhaps will change to some other temporary neurosis, and then may vanish as an altogether different malady comes on. (3) The class of which this case is an example,—senile neuralgia.

Neuralgia in its intense severity and enduring form is a malady of late life. It is the most formidable, the most distressing disease that life can bring, and it comes when the clouds should clear for the placid sunset, always longed for, seldom obtained. It is a disease of age. The influence of age on neuralgic pain is an important and significant fact, shown in a most striking way by the neuralgia which follows herpes. After the age of fifty years post-herpetic neuralgia is prolonged in proportion to age, or rather its persistence is longer and far greater than the ratio to age. In middle age the neuralgia is trifling, and will last only for a week or two, but at seventy it will last for years, and may never pass away entirely. That is true irrespective of situation. I remember that Sir William Jenner used to tell us of one striking instance of this. A man had herpes zoster on the calf of the leg. It was characteristic, and had left the usual

sequel. It was before the days of chloroform; he had everything done which could be thought of, and at last he consented to endure the pain of having that part of the skin and muscle cut away. Obtaining no relief, he shot himself. That may impress on you the intensity of the pain in the old which is trivial in the young. Why it should be I do not know, but we may form some dim conjecture when we remember that all these nerve-impulses are matters of, as far as we can see, chemical processes occurring in the tissues under the influence of life. The vital power of nutrition is the influence which renews the capacity for function, by replacing the molecules which have been changed by the functional action which has just occurred. As life goes on, the capacity for renewal becomes less perfect, so that molecules are formed less competent to achieve their purpose, more prone to give rise to abnormal impulses, and recovery from any other morbid process produced by outside influences is less perfect. The restoration of structure is not such as to enable it to do the normal work in perfect degree, and the degree of imperfection of constitution, so slight, it may be, as to us to be scarcely conceivable, may determine a morbid function adequate to produce intense pain where under normal condition hardly any sensation should be caused. Every morbid functional action is followed by a renewal of capacity for like action, but renewing it every time in an increased degree. The nutritional power of life is an augmenting influence, potent for all acquisition of capacity, healthy and diseased. The disorders of the nervous system that depend on morbid action are, by the vital processes of nutrition, self-perpetuating.

This patient is forty-seven years of age. Her case makes us call to mind as possibly important the fact that senility is individual, so far as concerns the time of life at which age becomes "old age," and come the transition must, unless the shears snap the thread before it breaks. It is not only individual, but often partial. Every gray or hairless head reminds us of the fact, and should prepare us to meet with local troubles in some patients which are commonly met with only in those who are much older. The patient is younger than most subjects of her malady. But in life's sad cadence, tones only just distinct in one generation dominate that of the next. The patient inherits neuralgia, but not in its senile form. Her mother suffered from nerve-pain for several years, but in another seat and form. The transmission of tendencies to disease rather than of precise disease is forever rising conspicuously before us when we endeavor to discern the relations of the morbid processes we have to treat. Each tendency may be inherited in hindered or augmented form, often through causes that we cannot trace. Senile changes in one person may come only a little before due time, and in the offspring may be definitely premature. The strength of tissue vitality varies and is capable of variation through direct and indirect influences. Its primary influence is on function, the changes in nutrition first thus manifesting their presence. Ultimately derangement increases to loss as nutritional alteration advances to structural

change. But this is clearly seen only when function readily reveals the early change.

There is another class of cases in which the inheritance of disease depends upon the inheritance of structural peculiarities, unimportant in themselves, incapable of manifesting their presence, and yet determining in an adventitious manner grave disease. Thus early death may be inherited through that which, save for its position, would entail no difference in any one of life's many features. Yet a simple inherited peculiarity in anatomical arrangement may entail inherited disease. I remember a peculiarity in the retinal artery that was the same in mother and daughter. I cannot doubt that a like inheritance of arterial branching may determine strain on certain cerebral vessels, and early atheroma so situated as to entail occlusion of an important branch. So also we may conceive that in nerves inherited characters may determine definite effect, and that far more frequently, and far more powerfully, inherited tendencies to nutritional failure or nutritional susceptibility may induce functional disorder. It may be transient in middle life, but enduring when in later life the vital power fails to maintain adequate nutrition,—that is, the due appropriation to the molecules of the elements on which proper action depends. We can understand that the liability to derangement at one age should be inherited as a liability to later failure, and that thus this woman should now present the most intense form of senile neuralgia, whose mother suffered from varying though severe neuralgia in other parts at an earlier time of life. It is four years since the pain, now so intense as to make her life one long agony, began. A decayed tooth was thought to be the cause of the pain. Many such irritative causes of neuralgia are real, although their removal may not cure, as with tape-worm and epilepsy.

Epilepsy—*i.e.*, repeated convulsions—may be due to tape-worm. It may be expelled, with its head, once and forever, but the fits go on, just as all the consequences of evil deeds live afterwards.

Paroxysmal pain is the analogue of paroxysmal spasm. It is facilitated by repetition, as is every functional process by the residual effect of augmented capacity. In this patient, moreover, some constitutional condition of peculiar character may have been at work. An inherited disposition may be augmented by another. The patient had, during each pregnancy, neuralgic pains in one cheek. The influence of pregnancy is often definite, but seldom the same. This morning I saw a lady subject to intense migraine who never had an attack during pregnancy. The relation of the state of pregnancy to the nervous system is alike important and mysterious. Why it should induce or hinder the same morbid state we do not know. We shall learn some day, and with it much more. The last attack in this patient began eight months ago, and has continued. It was sufficiently severe to cause the extraction of all her teeth. The pain persisted though the teeth were removed. Above the upper molars is, as you well know, a curious cavity called the antrum, a convenient receptacle for conceptions of

disease. Her antrum was then opened, apparently with the object of permitting the escape of whatever disease it might contain. Whatever was released, the pain remained. The operation did no good. But morbid processes do not always avail themselves of the opportunities offered them. So then her antrum was drained. But the source of pain was not even drained away. Yet some effect resulted. She improved slowly. We should remember that many remedial measures which do not do good directly do harm indirectly by lessening the patient's strength. This is a rule applicable to many diseases, which is rather apt occasionally, in the flush of therapeutic energy, to be lost sight of.

She is now suffering from many attacks every day, or was until she came here, and each begins by a curious sensation, which is not actual pain, near the junction of the left lower alveolar margin of the ramus of the jaw. She describes a flickering sensation at the extremity of the upper gum. This soon becomes a darting pain, which spreads to the lower jaw and seems to pass upwards and backwards. Sometimes it begins in the lower jaw. Any movement, any touch, will bring on a paroxysm, especially if it is a little time since she has had one. The attack seems in some way to exhaust the tendency, so that a touch immediately after an attack will not cause one, while the same touch would cause one after an interval. It is just as with migraine: a patient who, a month after an attack of migraine, could not eat a mince-pie without another attack, may eat two such evil but pleasant things a few days afterwards without effect. So also it is with epileptic attacks. The recurring influence of each functional process is to induce a nutritional development of renewed tendency, which takes some time to reach a high degree. Except just after an attack, any movement of her tongue in that part of the mouth will excite a paroxysm, but the more sudden the movement the more severe and immediate is the pain. I can show you the difference. You will see that a very slight touch, if sudden, will cause an attack of pain, but a very much more severe pressure may be made very gradually without pain. It is one instance of a general law. A galvanic current gradually increasing may be passed through a nerve without exciting it, but if suddenly increased it at once causes stimulation. This is true also of the interruption of the current. I can show you a similar effect in the mechanical effect of pressure on the sensitive nerves of the patient. I press very gradually until at last I am pressing firmly, and yet the patient says that it does not produce pain. I press suddenly, and you see at once evidence of suffering. I again press gradually, and gradually lessen the pressure, and there is no pain. Again I press gradually, and suddenly withdraw the finger, and pain is acute. The patient has had fewer attacks of pain during the past week, but she has had more slight continuous pain. The substitution of this for the intense paroxysms is probably an improvement, but the patient seldom realizes it. A present evil, vivid in its experience, always seems greater than that which memory only presents to the consciousness. The slighter constant pain seems to her harder

to endure than even the frightful paroxysms she suffered with intervals between of perfect freedom. The patient has been admitted with a view to an operation upon the nerve, but at present we have only an example of the frequent difficulty that is due to some improvement produced by the perfect rest or by the treatment it is right to try.

The result of division of the nerve is sometimes great and sometimes most disappointing. Benefit apparently depends upon the effect of preventing all afferent impulses from the periphery. When the neuralgia depends upon nutritional changes in the centre, rendering it unduly active, so as to generate impulses, the activity may be kept up, and the paroxysms of pain caused by impressions from the periphery which normally would have no effect. If the morbid process is actually in the periphery, or in the nerve-fibres which conduct and are also excitable, and the nerve can be divided above the morbid process, then the morbid impressions are arrested. But it may be that even then the effect is not absolute, because the repeated abnormal impulses giving rise to the pain may have brought the centre into a state of spontaneous over-action, and neuralgia, primarily peripheral, may be ultimately central, and thus continue when the peripheral cause is removed from action. It is a similar process to that of epilepsy due to a tape-worm in the intestine, and may persist for years after the cause is expelled. Such arrest of the peripheral impressions is a point of great importance in treatment, but it is so formidable that only when other measures have failed can it be proposed. In many cases, especially in those which are not of long duration, we have the means of lessening the peripheral impressions for a little time each day by the hypodermic injection of cocaine, and, slight as this may seem to be, yet by its repetition it has often in time an unquestionable influence. Moreover, the importance of combining several influences, each of which alone has but slight effect, is often strongly impressed on the practitioner. It interferes seriously with the progress of therapeutic science, but we have to gather for the general good the fragments that we can secure without individual harm.

I can glance at some only of the more important of the other general elements in treatment. Apart from the removal of causes and the operative treatment, the chief measure is the promotion of the general health by every means in our power, avoiding whatever lowers the tone of the nervous system, and endeavoring to strengthen it by drugs, and to lessen, if we can, the tendency to its over-action in the same way. I do not hesitate to speak of treatment by drugs. I hold that their influence is by conveying energy in special forms to special structures in which energy is evolved. I wish we could associate drug with drag and draw. Alas! Professor Skeat forbids, and from his decision there is no appeal. He only permits us, as the source of the word, dried roots and sugar-plums. Well, "these things are an allegory," without doubt, but not that which I desire. In passing, may I ask if you know Skeat's "Concise Etymological Dictionary," in which words are arranged according to their derivation? If

not, let me urge you to spend on it the first seven shillings and sixpence you can save or beg (I will not go farther, though I almost might). But, frankly, if a copy cost five pounds, I would sell any books I have, to that value, in order to obtain it.

To see the real significance of the use of drugs—as dynamical therapeutics—we must realize that all the impulses in the nervous system are the result of chemical processes occurring in the nerve-tissue. In this the molecules, their composition and arrangement, are determined by the influence of life, mysterious, inscrutable to us perhaps forever. But the processes depend on energy latent in the molecules, released by chemical union. Most drugs, like most food, are of value not as matter but because they convey energy. These chemical compounds present latent chemical energy in certain forms, and by entering into the composition of various structures they modify their composition or action or both: thus they do good; thus also at times they do harm. But into this question, fascinating as it is, I cannot go. You will find its grounds discussed in the address I have already referred to.

In the treatment of neuralgia I confess my own experience does not lead me to express any high estimate of the older drugs, such as sulphate of copper, but the influence of direct sedatives is unquestionable. The influence of cocaine is purely local, it is simply to arrest the afferent impulse; but the influence of morphine is central, it has special action upon the sensory structures. A strange thing, which may not have struck you, is that morphine and opium seem to have a special action upon the centre which is over-acting, so that the agents will quell pain without producing sleep, and indeed at first in doses too small to cause sleep, if only they reach the centres with the sudden momentum secured by hypodermic injections. As a rule, in my observation the greatest benefit has been obtained from the milder sedatives, especially Indian hemp and gelsemium, while the tonic effect that is usually essential for permanent benefit is produced, I think, even on the sensory structures, by strychnine more effectually than by any other drug. Its effect also seems to be proportioned to the momentum with which it is brought to bear upon the elements, and as it is not always convenient to give it as a hypodermic injection, and it is well to convey the momentum of its tonic influence with the momentum of gentle sedative influence, I have been accustomed to combine strychnine with Indian hemp or gelsemium, and to secure their more rapid transit by giving at the same time nitroglycerin. Our pharmacopœial one-per-cent. alcoholic solution called *tinctura trinitrini* is most convenient for the purpose. The important thing is that the initial dose should be uselessly small and rapidly increased, and that the mixture should not be alkaline. From this I have seen results, even in such cases as the patient before you, exceeding anything I could have expected, giving greater and more permanent relief than any other therapeutic measures, so much so that the treatment has made it unnecessary to operate on some patients who were admitted for that express purpose.

MYELITIS; LOCOMOTOR ATAXIA.

A CLINICAL LECTURE DELIVERED AT THE BUFFALO GENERAL HOSPITAL.

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MYELITIS.

THIS patient is a married man, aged thirty-two. He has not been well for six years. His work was in a wholesale shoe-shop, where he was not exposed to cold and damp nor was hard labor required. His first symptom was numbness of the feet creeping up the legs, so that he thought he had some form of rheumatism. On asking a leading question, I learn that he occasionally suffered from crawling and tingling sensations in the legs. Later he began to lose control of the bowels, and still later the urine began to pass involuntarily. Some time after these symptoms he had the sensation of a band drawing him in the epigastrium. He had no sores on the body though there was a tender lump on the left side. Very often there is a herpetic rash accompanying girdle pains; sometimes, in graver cases, the sores will be deeper. All this time he was able to move around with the help of a cane, though locomotion was tedious and the numbness in his feet gave him the sensation of stepping on a cushion. When he entered the hospital he could not walk at all.

With regard to family history, he states that his father died of spinal disease, his mother of some liver complaint; one brother died of fever after a short illness. Of his aunts and uncles he knows nothing; his maternal grandfather died of old age, being nearly ninety. On the whole, the history is negative.

At his first visit to the hospital, four years ago, he had lost all control of the bowels and bladder and of the voluntary muscles below the umbilicus; sensation was delayed, and there was absence of the patellar reflex. The diagnosis was made of locomotor ataxia, but the patient did not believe us, and he worked five months after he left the hospital. In stripping the patient preparatory to examination, we come upon a leather jacket which he has worn ever since his first visit to the hospital. You will notice a slight prominence of the lower dorsal and upper lumbar vertebræ. It is scarcely marked enough to account for his symptoms of myelitis, except that we know that such a mild degree of deformity may be accompanied by the necessary internal changes to effect a marked paralysis. Commonly, an inflammation of bone, especially of vertebræ, is tubercular. Otherwise we should not expect such a deformity to come except from the pressure of an aneurism or some parasitic disease. Most of the trouble in the present case

must be in the bodies of the vertebræ. If there has been enough inflammation in the vertebræ to throw out the column posteriorly, you can imagine that there may have been a great deal more in the spinal canal. It is not that the bones have bent so as to exert pressure on the cord, but there has been enough exudation into the spinal canal to narrow its lumen and gradually benumb the cord. At first the numbness was, so far as the cord itself was concerned, a functional disturbance just as numbness may be produced in a nerve by pressure from without. In this man's case the process of inflammation has subsided, but there has probably been left behind a certain amount of cheesy matter, which has so interfered with the circulation in the cord that degenerative changes have taken place in the cord itself. Thus the trouble, originally functional so far as the cord itself was concerned, has become an organic lesion. Usually, in such cases, we get three lines of symptoms,—(1) those referable to bony deformity, such as the inspection of the back reveals; (2) those pointing to pressure on the nerves, as when pain is felt running half-way around the body or when the nervous disturbance is marked by a herpetic eruption; (3) finally, we have symptoms referable to the cord itself, consisting, in general, in suspension of function. Paralysis develops slowly as pressure increases or as degeneration progresses, the symptoms creep along upward, there being first loss of power in the legs, then loss of control over the sphincters, then paralysis of the upper portions of the body.

A great deal can be done for conditions of this kind. This patient, who formerly could not walk at all, can now walk quite well with the aid of crutches, in spite of the fact that, since he was paralyzed, he has lost a leg by an accident. He has regained complete control of the bladder and bowels,—an improvement that adds immeasurably to his comfort and self-respect. The next point of treatment is to lift up the man's spine, and, by the aid of the jacket, keep it in a straight position. In the early inflammatory grade of the trouble, it would have been unwise to apply a jacket and allow the patient to be about. He was, therefore, kept in bed and gentle traction was made. Almost the full attainment of extension to be hoped for from the wearing of the jacket has been achieved. As the spine is now pretty well fixed, I believe that the slight deformity now visible is permanent. Can there be anything further done to improve the functional activity of the cord? Bear in mind that there is a certain amount of thickening around the cord, due to the old inflammatory process, and that this undoubtedly exacerbates the permanent impairment of the cord. I believe that massage of the cord—and I use the term advisedly—will do more than anything else. By massage of the cord I mean suspension by the occiput and chin. If you are going to give a man suspension, you do not want the weight of the body thrown on the arms. In such a method of suspension the strain is carried by the muscles of the shoulder to the sacrum, and really, if he chose, the patient could flex his spine and still apparently be hanging by the neck. I believe the neglect of

this consideration is one of the causes of failure from head-suspension. I believe that, if this treatment is carried out persistently, the patient will be somewhat benefited, although no miraculous results are to be expected. The patient states that yesterday he felt a little prickling in the legs and feet, such as he has not felt for a long time, and he walked up and down the ward with greater ease than usual. In addition to the continuance of suspension, I am going to have a little steel support put into the side of his jacket, so that, while he is in bed or walking about, a screw can be turned to make extension on the spine. This extension can be relaxed whenever he needs to use his arms.

Counter-irritation would naturally be thought of, but the sore on his back would interfere with wearing the jacket, and I believe that, on this account, it would be so much of a hinderance to the extension treatment as to be of no practical benefit.

The patient does not expect, with his amputated limb and paralysis, to be an active man, but he is anxious for the little improvement that can be afforded him. There is one point of warning in regard to the use of the treatment by suspension: several patients have been asphyxiated by therapeutic hanging, especially when self-applied. The compound pulley enables a man to lift himself very easily, but if he is alone and the rope twists or kinks, he may struggle to loosen it, and the apparatus may slip and strangle him before any one happens to come to his relief. I always arrange a signal that the patient can give whenever he wishes to be let down. There is always a facial expression of anxiety, so that you have no warning in this way, and sometimes, through inadvertence, the patient has been left suspended too long.

You may use electricity; it will do no harm and no particular good. Manipulation of the lower extremities with massage will be useful to revive the function of the nerves and maintain the tone of the muscles. The patient should not be kept too long in the hospital, for such cases are just the ones in which "hospitalism" is to be feared. He needs good air; in a general way he wants the hygienic treatment of tuberculosis, though he has not the disease in an active form.

LOCOMOTOR ATAXIA.

We have this morning a rather exceptional opportunity for viewing cases of spinal-cord lesion. By contrast I show you three cases of the most carefully-studied and best-defined cord-disease,—sclerosis of the posterior columns, or locomotor ataxia. Two of these cases appear through the courtesy of Dr. Mansperger and the third is a private patient of my own. Without delaying to give a long didactic lecture on this disease, I shall proceed to develop the characteristic symptoms of the malady. The disease usually begins low down in the cord and extends upward, manifesting itself in the pre-ataxic stage by three cardinal symptoms which should not admit of your mistaking the disease for anything else. The symptoms that I

refer to are lightning pains, the absence of the patellar reflex, and a peculiar condition of the pupil in that it is movable as the eye accommodates itself for distance, but is immobile for changes in the intensity of light. The pupillary symptom and the lightning pains should suffice for diagnosis.

This patient, a young man of thirty-six, has been ill about a year. He says that he caught cold and the trouble settled in his spine. He is a salesman, and he was not exposed particularly to cold. We cannot regard "taking cold" as an efficient factor in the production of this disease, although it is sometimes mentioned in that connection. His trouble did not come on suddenly, but he gradually lost the power of locomotion, although he can now walk quite readily. Those of you who are near can see that, when I light a match before his eyes, there is no contraction of the pupil; but as I ask him to look at the window at the end of the room and then at me, the pupil alternately dilates and contracts. This man is already in the ataxic stage of the disease. As he walks, you will notice that he tries to control his co-ordination, more or less, by the aid of his eyes. On asking him to stand with his eyes shut, he totters and would fall if I did not catch him in my arms. The ataxic symptoms are due, in great measure, to a loss of the muscular sense. I will ask the patient if he has any peculiar sensations in the feet. He says that his toes feel numb much of the time and he has had his wife scrub them with a brush in order to restore sensation to them. The floor does not seem solid to him unless he strikes it firmly. Sometimes, instead of describing their feeling as numb, patients will say that a solid floor feels as if it was very heavily rugged. You will notice that the patient in crossing his legs does so awkwardly. Covering his face with a towel, I ask him to put his right heel on his left knee. He makes several efforts, striking to the inner side of the knee and finally hits the knee quite a severe blow. He puts his index fingers together perfectly well, and there seems to be no ataxia of the upper extremities, as shown by the freedom with which he makes various movements. Now, putting his knee over mine and manipulating the leg, I get a sense of complete relaxation entirely different from the spastic condition which you have seen in lateral sclerosis. There is complete loss of patellar reflex on both sides. In attempting to get patellar reflex, you will notice that I do not strike a dead blow but make a quick staccato movement of the hand.

The patient says that for about a year he suffered greatly with pain, but that he is now relieved. The pains ran down his thighs and legs and were so severe that he would cry out. They were worse at night and were aggravated by fatigue. The last pain that gave him much trouble was at the inner side of the right tibia, giving him the feeling that the bone was about to burst open. The least touch on the skin would cause great agony. Usually the pains are described as burning or stinging, and, from the fact that they occur suddenly and without warning, they are often spoken of as lightning pains. This patient says that his pains were of this nature, but that he never had them about the body nor in the stomach.

Among the earlier manifestations of this disease are crises of girdle pains, but this patient for some reason has escaped them. His pains are characteristic in that localized areas are attacked suddenly. Vomiting and gastric distress in the crises may last for days; or there may be intestinal or even laryngeal crises, when there is a sense of suffocation and constriction.

The patient has never been a drinking man; alcohol is charged with bringing about this kind of trouble, but, if you have much experience in the treatment of tabetic patients, you will find that the hardest and longest drinkers are rarely affected,—not that their habits exempt them. Our patients are married men with families. Sometimes sexual abuse is assigned as a cause for this malady, but in my experience it is absolutely inactive. Even such abuse as is within the power of individuals is limited physiologically, and, although I have known patients who themselves attributed tabes to this cause, I could not agree with them. Probably the largest percentage of tabetic patients have had specific infection at an earlier date, and in such cases the ordinary tertiary symptoms do not develop. You must remember, however, that the cord lesions, even in these cases, are not pathologically syphilitic. It is supposed that some poison is developed in the progress of the syphilitic disease that reacts on the nervous system and brings about the change.

I want you to notice how this second patient gets up from his chair. That simple act is sometimes enough to base a diagnosis upon. There is a peculiar wavering of the lower extremities consequent upon the exertion. You will notice that his pupils are contracted almost to a pin's head, so that the light test has here very little significance; I will, however, try it, and, as we should expect, there is no change. Even with his extreme pupillary contraction, the pupil does react to distance.

This patient is a tailor, aged fifty-five, who has been sick three years. Among his earliest symptoms were the staggering gait—so that he was sometimes taken for a drunken man—and lightning pains which took the form of burning sensations in the right leg. Even in the present stage of the man's trouble, the tone of his leg is excellent, his muscles are firm, and there is no evidence of degeneration. This is characteristic of the disease; none of the patients here are emaciated, and, in general, the very effort which the lack of co-ordination necessitates tends to bring about a muscular development. Here also there is loss of patellar reflex. In this case, also, we have the three cardinal symptoms, pain, the Argyll-Robertson pupil, and the loss of patellar reflex. I do not purpose going deeply into the ataxic symptoms, for the reason that I want you to be able to diagnose the disease before it reaches the ataxic stage. This patient can walk around the room a little, but as he depends largely—as all such patients do—upon the sense of sight, it is almost impossible for him to stir about at night. Now, moving his right leg on the floor and placing his left foot on the round of a stool, then moving his right foot onto the top of the stool, his

eyes being all the time blinded, you observed that he lost track of his right foot, pointing to the floor when I asked him to show me where it was. Many patients lose their muscular sense so absolutely that they cannot tell a pound weight from an ounce, except as they can judge by the mere tactile sensibility. Yet it seems even more wonderful that a person should lose the ability to feel where his limbs are. You can realize better from this experiment why ataxic patients totter when they cannot guide themselves with their eyes, why they cannot walk in the dark, and why various simple movements are accomplished with the greatest difficulty. You and I can tell the position of our members by the sense of flexion or extension of the different muscles; in fact, many of you probably never even have realized that it was by means of the muscular sense that you were kept informed of the position of your limbs. Although the last patient had very good co-ordination of his upper extremities, this man can scarcely bring his index fingers together with his eyes covered. Yet his tactile sense is acute, for he names various objects, such as a knife, a match-box, and he even tells me that this coin is a five-cent piece. In your office, it is well to have the patient remove his shoes and stockings, and test his ability to feel with his feet such objects as a cane, the round of a chair, a rug, the bare floor, etc. Neither of these patients has any trouble with the bowels or bladder.

The third patient gets out of his chair better than either of the others. I will try the match test with him; his pupils do not react to light though they do to distance. There is one caution which you must observe in carrying out this test. If the patient has had his eyes fixed on some distant object, and you suddenly strike a match before him, the pupil may contract, not because of the reaction to light, but because the focus has been changed and the iris contracts sympathetically. About two years ago this patient came to the hospital, having had a stroke of left-sided hemiplegia with some difficulty of speech, though he was not aphasic. At that time he had a paralysis of the external recti muscles so that there was diplopia and he had to cover one eye in order to get a good image, the ocular muscles being unable to focus a visual image onto the corresponding spot of both retinae.

His gait is now quite good and he can turn rapidly. He says that he walks twice as well as he did a year ago. Two years ago, when he wanted to get anything in his room he would roll out of bed and then roll over and over till he reached it. Six or eight months ago he could not read; now he can amuse himself with books. He has had no pains for two months. The pains that he did have were like rheumatism attacking him in various parts of the arm. I am glad that he used the term "rheumatism," for patients often consult a physician thinking that the tabetic pains are an indication of rheumatism. This patient describes the pains as deep, feeling as if a knife had been stabbed into the flesh. Some time ago this patient had incontinence of urine which lasted about six months. The man is well developed and fleshy, having lost no weight on account of his disease. There is entire loss of patellar reflex, as in the other cases.

With a towel over his face, he has some difficulty in getting the heel of one foot to the toe of the other. He has no difficulty in touching the heel to his other knee further than that caused by his fatness. In making a circle with the leg, you will notice that he wastes a great deal of energy. He stands well with his eyes closed and even walks a step or two, but by the expression of his face you can see that he is making a tremendous effort.

About three years ago he had an attack of "erysipelas" which left him bald in spots. I think we shall have no difficulty in recognizing in what he calls "erysipelas" almost the only etiological factor which can be positively shown to have a bearing on the production of tabes. The duration of locomotor ataxia is extremely long. There is no use starting in on a line of treatment unless the case can be given protracted attention. The disease can be stayed, life can be made comfortable, and can be prolonged, but the disease is a fixture just as much as a scar on the surface, for there is the same permanent pathological change.

REVIEW OF MEDICINE.

MEDICINE.

IN CHARGE OF JOHN H. MUSSER, M.D.,

Assistant Professor of Clinical Medicine in the University of Pennsylvania; Visiting Physician to the Presbyterian and Philadelphia Hospitals,

AND

J. A. SCOTT, A.M., M.D.,

Physician to the Out-Patient Department of the Pennsylvania Hospital; Assistant Demonstrator of Morbid Anatomy in the University of Pennsylvania.

A Case of Apparent Death. (*Lancet*, February 2, 1895.) By R. Mitchell, M.D., of Bury.

"Mrs. S. was a very healthy woman up to the last three years, when she began to suffer from pain at the stomach and sickness with diarrhœa. She gradually got worse and became very emaciated,—white and bloodless in appearance. Three or four days before death she on several occasions appeared to be on the point of death, and at these times the friends were all assembled to witness her last moments.

"On the night of January 16, 1895, she was very restless up to midnight, when she asked to be placed on her left side, and all the pillows and bolsters to be taken away, and she went into a quiet sleep which lasted till 2.30 A.M., then she gradually stretched her arms by her sides and her legs straight down, and became stiff and cold. Her jaw dropped, leaving her mouth open, and the son and nurse placed a little ice in it, but it ran out again. She did not open her eyes, did not breathe, and her heart, which

was felt by her son and nurse to slowly beat, gradually ceased in about ten minutes. The nurse, experienced at death-beds, and the son believed her to be dead. They left her as she lay for one hour and twenty minutes, when they carried her up-stairs to a bedroom with the assistance of a woman who had often helped in cases of death before. And these women remarked that the body was very stiff and cold and that they would just have time to 'wash and lay her out' before she would be too stiff. Arrived in the bedroom, the body was placed on a sheet on the floor, washed, and dressed in the customary dead clothes, and then placed on a bed with a board beneath it. The laying-out was completed by 5 A.M., and during the morning friends frequently went to see the supposed corpse, and all aver that there were no signs of life. The undertaker who measured her body for a coffin believed her to be dead. Several who had occasion to touch the body said it was cold and stiff as death. About 10.30 A.M. two women were arranging the chamber when the supposed corpse coughed, the pennies which were on the eyelids fell off, and the women ran down-stairs in terror and could not be persuaded to go back. Other women went and watched the gradual recovery of the life. The eyes opened without signs of consciousness, the breathing became freer and stronger, and the pulse better. These women say 'she gradually and slowly came round.' I saw her about 1.30 P.M.; she was lying as 'laid out,' her eyelids opened and closed, her breathing was regular and the bedclothes could be seen to rise and fall on the chest; her hands were clasped across the chest, and the pulse was easily felt, soft and regular. She was quite unconscious; the limbs were stiff and cold, possibly due to lying in a cold chamber for eight hours. She was removed to a warm bed, hot bottles were applied, and brandy and warm water given in small quantities, and in the evening she spoke in whispers, asking to be put in her own bed, and other sayings, which showed her to be conscious. She never made any allusion to the state she was in during the morning, and was never conscious before the evening of that day. She gradually became weaker and weaker, and died at 7 A.M., on January 18, twenty-eight hours after the supposed death, in exactly the same attitude and with exactly the same signs as in the preceding morning. The body was very much worn, and in sleep the face was like that of the dead. She had taken nothing but ice or a little water for days. There was an extensive bed-sore slough at the bottom of the spine; it was black and had been exquisitely painful."

Pernicious Anæmia. (*Lancet*, December 1, 1894.) By C. T. W. Hirsch, District Medical Officer of Rewa, Fiji.

In a report of one hundred and twenty-six cases treated in the Rewa district, 1893, the writer states that forty-one cases died, thirty-four were returned to India as chronic invalids, twenty-five are still under treatment. The remaining twenty-six have returned to work, though a considerable number are still weak. Of these cases ninety-eight were males and twenty-

eight females, this preponderance of males probably being partially due to the fact that more male than female immigrants are introduced. In one hundred and ten cases the first symptoms noticed were those of gastric disturbance and slight diarrhœa. In ninety-four slight icterus was present. In all the anæmia was most intense.

Hemorrhages did not seem as common as would be inferred from the text-books. Four cases had metrorrhagia and eight showed signs of retinal hemorrhage. In twenty occasional melæna was present. Dropsy occurred in fifty-one cases. General anasarca, ascites, and pulmonary œdema were common precursors of death. The urine was very dark in color. Blood-pigment was present in five cases, but no red blood-corpuscles were noticed. The blood in the cases examined showed microcytes and poikilocytes, leucocytosis, and a quite marked reduction in the hæmoglobin. In the cases attended with diarrhœa the ova of the ankylostoma duodenale were frequently seen. In seven cases in which male fern had been given specimens of the ankylostoma were present in the stools.

A nitrogenous diet seemed to cause diarrhœa. A farinaceous diet with milk and cocoa, and consisting chiefly of sago or arrow-root, with bread and milk, and roasted taro seemed most suitable.

Spirits with extras, such as eggs, formed useful additions to the diet. Arsenic was the most useful drug. It seemed to be better borne by the patients when taken in conjunction with five grains of salol three times a day. Diarrhœa was best treated with intestinal antiseptics.

In the autopsies of twenty-six fatal cases the noticeable points were general pallor of all the organs and fatty changes in a large number of them. The heart showed the most marked fatty changes. In many cases the papillary muscles showed the "tabby-cat" situation. The liver was invariably large and pigmented. In seven cases the spleen was swollen and pulpy. In one case in which the suprarenals showed changes there were scattered tubercles in the lungs. In all other cases the suprarenals were normal.

The stomach was normal in all but four cases, in which it was much congested. The intestines in two cases showed signs of ulceration. In eighteen cases the ankylostoma was found in the duodenum. The blood-vessels were apparently healthy. In two instances the marrow of the long bones was excessively red and showed irregularly-shaped corpuscular elements.

The writer hopes to make a more complete and definite report later.

A Case of Persistence of the Ductus Arteriosus in an Eight-Year-Old Boy, with Marked Clubbed Fingers. (*St. Petersburger medicinische Wochenschrift*, 1894, No. 41.) By L. Stembo, M.D.

The author reports the case of a boy, eight years of age, with good family history, but who had at three years of age a severe attack of scarlet fever complicated by nephritis. Following the disease there was observed

a light cyanosis, which persisted. A playmate was killed by lightning close to the patient, and he was much frightened, with short breathing and marked cyanosis. He had after this typhoid, later inflammation of the lungs, and two years ago variola. He came into the hospital with an attack of mumps. He has often had catarrhs and not unfrequently hæmoptysis, and also blood in the stools. The present cyanosis is marked for one of his years: his lips are dark blue, and the gums nearly black. The veins of the neck can be seen to pulsate distinctly, and there is a tremor in the region from the second to the fourth costal cartilages, and a pulsation in the epigastrium. There is marked cyanosis in the terminal phalanges of the hands and feet, and they are distinctly clubbed. Pulsations can be felt at lower third of the sternum and at the point where we auscult to hear the pulmonary sounds. This and the tremor are synchronous with the systole. Percussion shows increased heart's dulness in the parasternal line. To the left the dulness is nearly normal; between the second and fourth left ribs, however, there is a dulness, quadrilateral in form, extending outward from the margin of the sternum. This symptom is given by Leube as first described by Gerhart as diagnostic of the persistence of the ductus arteriosus. By auscultation we find a systolic murmur at the apex; a like murmur over the sternum and pulmonary artery. The second pulmonic sound is markedly accentuated, and the systolic murmur heard over the pulmonary can also be distinctly heard in the carotid. There is no difference in the arteries of the upper and lower extremities; nor is the pulse delayed in the lower extremities.

The Heart-Muscles and Ganglia with Especial Reference to the Sympathetic Nervous System. (*Wiener medicinische Blätter*, 1894, No. 43, p. 653.) By Wilhelm His, M.D., of Leipsic.

Although agreeing with von Kölliker in the greater part of his theory concerning the function of the sympathetic nervous system, this author believes it possible that further research will show other trophic functions of these ganglia in the heart; but he does not believe that they have as yet been proved to be the automatic, co-ordinating, and motor centres of the heart's function; for all the research which has so far tended to show this has been done with the heart under stimuli produced by abnormal mechanical influences, produced by wounds through which sections of the ganglia may have been produced the cessation of motion, since under normal conditions these very ganglia are the ones which produce the necessary motor stimuli.

A Case of Diphtheritic Vulvitis in a Child. (*Journal of Cutaneous and Genito-Urinary Diseases*, December, 1894.) By A. L. Gnichtel, M.D., of New York.

The author reports a case of vulvitis in a child who, her mother stated, had, five days before the first observation, become irritable and restless and

had shown signs of pain about the genitals. Examination of the vulva revealed several patches of grayish-white, false membrane covering the internal portion of both labia majora and nymphæ and which was invading the urethral orifice. Bacteriological examination showed diphtheria bacilli. Two fatal cases of diphtheria had occurred in the house in which the child lived. There were no constitutional symptoms and no throat symptoms. The child recovered with the use of local treatment only.

THERAPEUTICS.

IN CHARGE OF ALEXANDER D. BLACKADER, B.A., M.D.,
Professor of Therapeutics, McGill University, Montreal, Canada,

ASSISTED BY

D. I. EVANS, M.D.

The Use of Cocaine to prevent Respiratory Disturbances during Chloroformization. (*British Medical Journal*, January 5, 1895.) By Wm. Robertson, M.D.

The writer in a letter calls attention to the ease with which a patient whose tonsils and postnasum have been previously pencilled with a solution of cocaine takes the anæsthetic. He also quotes Rosenberg (*Medical Week*, November 23, 1894), who states that, if the mucous membranes of the upper air-passages are anæsthetized by cocaine before the administration of the chloroform, reflex respiratory disturbances consequent upon their irritation are obviated. Dr. Robertson states that in his own cases, when this method was employed, less chloroform was used, and the patient went under its influence more quickly and with less struggling.

The Thyroid Treatment. (*Berliner klinische Wochenschrift*, January 14 and 21, 1895, and *British Medical Journal*, February 2, 1895.) By Professor Ewald.

The writer relates a case of myxœdema greatly improved by the use of thyroid tablets, but in which the use of thyroid extract had little or no effect. During a period of observation no change was found in the nitrogenous products of the urine, and the body weight remained fairly constant. The author remarks upon the question of exact dosage, and suggests that perhaps the active principle might be obtained by dialysis after the thyroid gland had been subjected to peptic digestion. Two cases of Graves's disease were treated in this way without benefit. In three cases of obesity, no effect was noted in one; a loss in weight of three and a half kilogrammes was registered in another, but eight weeks after cessation of treatment the weight increased again; the third lost nine and two-tenths kilogrammes. In the last case the general appearance suggested the presence of myxœdema,

but the characteristic symptoms were absent. In eight cases of struma simplex treated with thyroid tablets, a diminution in the size of the goitre was noted in every instance.

The Influence of Injections of Thyroid Juice on Obesity. (*La semaine médicale*, January 2, 1895.) By Dr. Charrin.

At a meeting of the Biological Society this physician reported the result of his observations on the action of thyroid juice in producing emaciation. It was given in daily doses of one gramme, either by hypodermic injection or by the mouth. In some cases very good results were obtained, but in others no effect was noticed. One adult patient, suffering from extreme adiposity, lost thirty-six pounds in three months. On suspension of the treatment the weight began again to increase, but loss of weight followed the further use of the thyroid extract. The variability of the results he thought might be attributed either to a difference in the conditions of obesity or to the use of an inferior quality of thyroid extract. None of the patients treated were subjects of exophthalmic goitre.

The Use of Chlorine in the Treatment of Typhoid Fever. (*New York Medical Record*, February 9, 1895.) By R. W. Wilcox, M.D.

In a paper read before the Medical Society of the State of New York, Dr. Wilcox calls attention to the value of chlorine in the treatment of typhoid fever. Experience he says has shown that it can be taken in quantity sufficient to be antiseptic, and stimulant to certain organs, without producing injurious effects. It stimulates respiration and the heart's action, and notably increases the flow of saliva and the bile. By its action on the kidneys it assists in the more rapid elimination of toxins. In typhoid fever, the use of chlorine in moderate doses lowers the temperature, calms nervous disturbance, cleans the tongue, improves digestion, and has a favorable action on the intestinal ulceration. The writer uses one to four fluidrachms of chlorine water every two to four hours.

The Value of Acetanilid in Vomiting. (*Therapeutic Gazette*, November, 1894.)

Editorial attention is here called to the employment of this drug in the treatment of obstinate vomiting, particularly when this vomiting is due chiefly to nervous disturbance or marked gastric irritability. In the treatment of the vomiting following operations with anæsthesia acetanilid is particularly useful, and the administration of two grains every hour till six grains are taken will often prevent this annoying symptom. It is suggested for trial in the treatment for the vomiting of pregnancy.

The Serum Therapeutics of Pneumonia. (*The Lancet*, January 26, 1895.)

In a short editorial the writer gives a review, condensed from *L'Union*

médicale of December 8, 1894, of what is being done in the application of the serum therapeutics to the treatment of pneumonia. Numerous experiments have been made on animals, and several attempts have been made to treat patients in the same manner. Drs. F. and G. Klemperer have treated twelve cases of pneumonia with the serum of rabbits artificially immune. In five cases crisis occurred as in the ordinary course of the disease, but in the remaining seven each time the serum was administered there was a diminution in the height of the temperature and in the frequency of the pulse and respiration. They also injected eight patients with cultures of the pneumococcus which had been deprived of toxicity, the temperature falling soon after the injections. They also inoculated patients with the serum of other patients suffering from pneumonia, obtained immediately after the crisis. Frequently defervescence at once followed. Foa and Scolia, Jansen, and Lava all report cases in which this method has been employed with more or less success. In many of the cases the crisis appeared to be hastened, convalescence was rapid, and no complications followed. Taken as a whole the above series of experiments are satisfactory, and the serum therapeutics of pneumonia deserve further trial and investigation.

Treatment of Tuberculosis with Yeast-Nuclein. (*Medical News*, December 15 and 22, 1894.) By Victor Vaughan, M.D.

The writer in a very interesting paper gives us the result of his observations on the therapeutic action of the nucleins. His previous experiments on rabbits, etc., led him to the conclusion that nuclein and nucleinic acid are powerful germicides; that the germicidal constituent of the serum of blood is a nuclein; that rabbits and guinea-pigs may be protected against virulent cultures of the diplococcus of pneumonia by previous treatment with hypodermic injections of a solution of yeast-nuclein; that the immunity thus secured is not due to the action of the nuclein as a germicide directly, but most probably depends on the stimulating action of the nuclein on some organ whose function it is to protect the body against bacterial invasion; that, in order to obtain the immunity, the inoculation with the germ must follow soon after the administration of the nuclein. Attempts to arrest tuberculosis already developed in guinea-pigs by treatment with yeast-nuclein have been followed by varying results, depending on the virulence of the germs inducing the disease, the stage of the disease when treatment is begun, and the susceptibility of the animal. Experiments on rabbits show that they may be rendered immune to tuberculosis by previous treatment with yeast-nucleinic acid (one per cent.). Further, the development of tuberculosis in rabbits may be prevented when the treatment is begun within three or four days after inoculation. Stimulated by these results, Dr. Vaughan has tried this method of treatment in twenty-four patients, and tabulates the conclusions he has so far reached as follows: (1) in cases of pulmonary tuberculosis with cavities it does no good; (2) in long-standing cases it may retard the progress of the disease so long as secondary

infection with pyogenic germs does not occur; (3) a temporary cure (the cases have not been long enough under observation to say more) may be obtained in early cases of small area; (4) it has proved serviceable in urinary tuberculosis. Finally, Vaughan states that the nucleins in other substances may act equally well as yeast-nucleinic acid.

Hydrotherapeutic Treatment of Neuralgia. (*Deutsches medicinische Wochenschrift*, December 27, 1894, and *British Medical Journal*, January 26, 1895.) By B. Buxbaum, M.D.

The writer thinks that the hydrotherapeutic treatment of neuralgia has hardly received in practice the attention which it deserves. In neuralgia of rheumatic origin it acts by inducing increased blood-supply to the affected parts, and in the neuralgias following upon infective diseases, or due to intoxication by mercury or lead, it promotes the elimination of the poison. In eighty-three typical cases of neuralgia this treatment was unsuccessful only in five per cent. The alternate application of heat and cold is most to be recommended. The alternating Scotch douche is particularly of service. In trigeminal neuralgia, hydrotherapeutic measures applied to the whole body are the most suitable. Other indications should of course be attended to at the same time, such as anæmia, malaria, etc.

SURGERY.

IN CHARGE OF HENRY R. WHARTON, M.D.,

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AND

JOSEPH P. TUNIS, A.B., M.D.,

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Fracture of the Hyoid Bone; Acute Bulbar Paralysis; Recovery. (*Lancet*, December 8, 1894.) By Henry Kay Ramsden, M.B., of Hauteville, Guernsey.

A man, fifty years of age, while engaged in unloading a wagon, fell four yards, lighting on his head. For fourteen days following the accident he was feverish and delirious. He could speak only with difficulty, was unable to swallow solid food, and took liquids with difficulty. Saliva dribbled constantly from the angles of the mouth. On examination the hyoid bone was found fractured at the junction of the body and greater cornu on each side. In addition to the symptoms before mentioned it was observed that the right half of the tongue had atrophied and that this organ was protruded to the right. The lips were slightly wasted; the speech was of the nasal tone, inarticulate and unintelligible. Liquids were

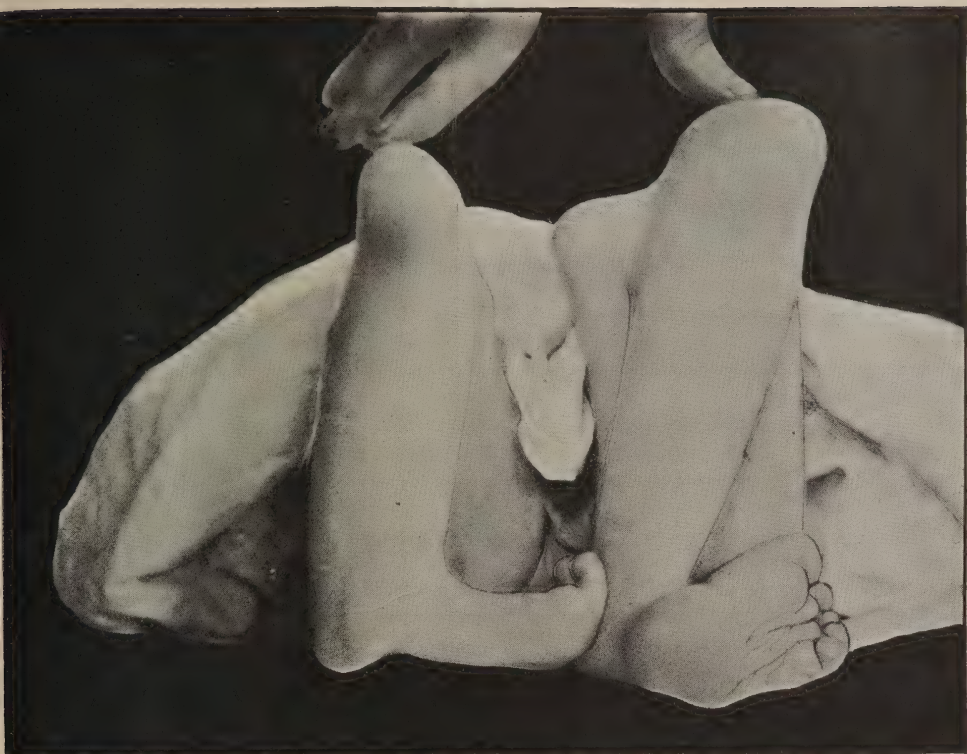
frequently regurgitated through the nose. At the time of writing the tongue has increased in bulk and the dribbling of saliva has disappeared. Although the speech is still somewhat impaired, the patient can readily be understood and he can blow and whistle. Swallowing has improved so that solid food can be taken. The fracture has united by fibrous union. The diagnosis of acute bulbar paralysis had to be made from injury to the hypoglossal nerve at the seat of fracture, hemorrhage into the vagus centre, and labio-glosso-laryngeal paralysis. Acute bulbar paralysis is the only diagnosis which will explain the combination of symptoms. The pathological condition must have been hemorrhage into the medulla, since the symptoms came on so suddenly, hemorrhage probably produced at the time of the accident. The treatment consisted of the wearing of stiff collars, attention to the general health, and the administration of tonics.

Amputation of Both Legs at the Knee-Joint for Paralytic Club-Foot in a Case of Spina Bifida and complicated by Congenital Inguinal Hernia, in which the Testis and Appendix Vermiformis were removed during an Operation for its Radical Cure. (*Therapeutic Gazette*,¹ December 15, 1894.) By William J. Taylor, M.D., of Philadelphia.

In a patient, aged six years, the following deformities were noted. The laminae and spines of two of the lumbar vertebræ are absent, and there is a spina bifida over this site. On the right side there is a complete, congenital, inguinal hernia. On the right side the hip-joint and upper part of the femur are normal. The femur gradually tapers towards a blunt point, with an absence of condyles. There are two bony knobs on the inner side of the thigh. The muscles of the thigh are poorly developed. The patella is absent. The tibia is dislocated backward on the femur, the fibula is absent, and the muscles of the leg are much wasted. At the ankle there is a dislocation backward and upward. The foot is inverted and the toes point inward. The great toe is absent. The pulse in the dorsalis pedis artery is distinguishable. The leg can be completely flexed on the thigh, but can be extended only to a right angle. On the left side the hip-joint and upper part of the femur are normal. At its lower third the femur bifurcates, and there is a knob of bone projecting downward and inward. The condyles are very small and the patella is absent. The knee is dislocated backward and upward, and is flexed, making an angle of about 60° when fully extended. There is a small fibula which turns around the tibia until it comes in front of it at the ankle, the external malleolus being in front. The foot is in extreme talipes varus. Motion in the hip-joint is almost perfect, in the knee-joint is slight, and in the ankle-joints is *nil*. Sensation in both limbs is good and the electrical conditions of the muscles are normal. The left leg is a little larger than the right (Fig. 1).

¹ Cuts kindly loaned by the Publishers of the *Therapeutic Gazette*.

FIG. 1.



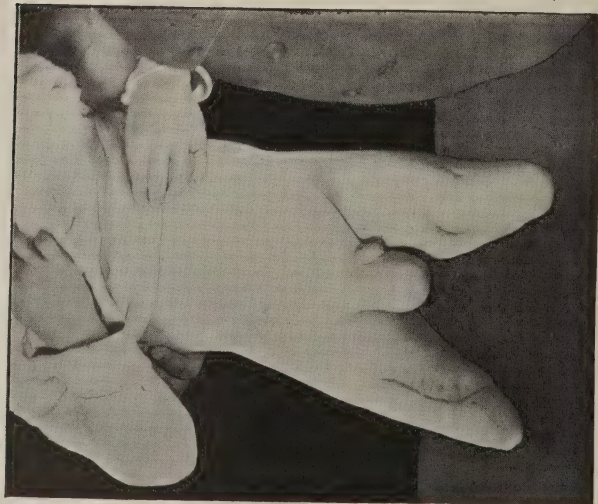
Showing the deformity before operation. Patient lying upon his back in bed, as it was impossible to extend the legs further than a right angle.

FIG. 2.



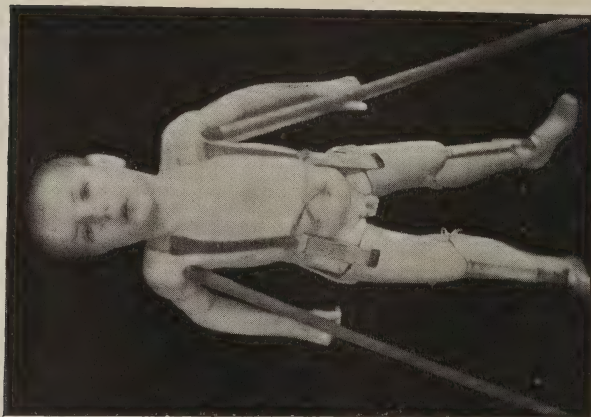
The legs and feet after their removal.

FIG. 3.



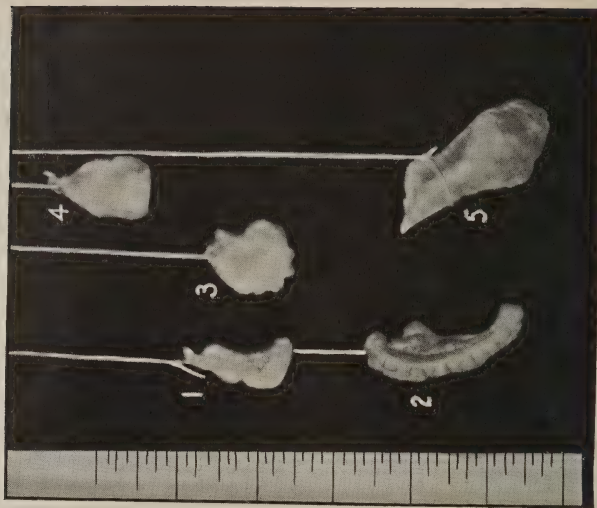
Appearance of the stumps after complete recovery from the amputation, and the scars made in the removal of the projections of bone. It also shows very accurately the hernia.

FIG. 4.



The artificial legs applied.

FIG. 5.



1. Testis. 2. Appendix vermiformis. 3, 4. Bony spines from right femur. 5. Bony spine from left femur.

The left leg was amputated at the knee-joint and the recovery was uncomplicated. After two months the right leg was also amputated at the knee-joint. The bony knobs were removed at the time of amputation (Fig. 5, 4 and 5). Recovery from this operation was also perfect. The appearance of the amputated limbs will be seen by referring to the plates (Fig. 2). After the amputations the stumps healed perfectly; but the hernia still remained to complicate the fitting of artificial limbs (Fig. 3). In eleven weeks after the second amputation, therefore, the hernia was operated on by Dr. Keen. Besides the bowels, the testicle, cord, and appendix vermiformis were found in the sac. Halsted's modification of Bassini's operation was done on the hernia and the testis and appendix vermiformis were removed (Fig. 5, 1 and 2). The patient's recovery has been rapid and his convalescence has been perfect. Artificial legs were fitted to the stumps and the patient can walk alone without the aid of crutch or cane. Figure 4 shows the artificial legs adjusted.

An Addition to our Knowledge concerning Tumors of the Penis. (*Archiv für klinische Chirurgie*, 1894, vol. xlix., No 1.) By Dr. Buday.

Two interesting cases of rare tumors of the penis are carefully described both in there macroscopical and microscopical appearances. The first case was undoubtedly a true epithelioma arising from the inner surface of the prepuce; its structure showed undoubted malignancy, and was of a cystic adenopapillary character. The second case simulated an elephantiasis: there was thickening of the entire penis with no involvement of surrounding structures, while the clinical and anatomical characteristics were different from those of ordinary epithelioma. On the side of elephantiasis was the rapidity of its growth, the paraphimosis, and the resultant swelling of the penis and the formation of fistulæ through the urethra. In favor of epithelioma were the density of the tumor, its well-defined outline, and the fact that the fistulæ were formed without inflammation and no suppuration, the discharge being a comedo-like material. The microscopical examination showed a papillomatous epithelioma, the papilloma arising from an atypical tissue-hypertrophy.

The Presence of Albumin in the Urine as a Result of Etherization. (*Münchener medicinische Wochenschrift*, 1894, No. xli.) By Barenfeld, M.D.

The results of the studies made by this author, in one hundred and fifty cases in which he examined the urine, both before and after etherization, go to prove that the objection made to ether, on the ground that albumin is found in the urine after its use, is a fallacy. The author found but one case in which albumin was present after etherization, where it had been absent before, out of one hundred and fifty cases, and this disappeared five days after the operation. The results obtained agree with those of Fueter and Roux, and tend to show that albumin cannot be found after etheriza-

tion where it did not previously exist, and that there is in fact no such condition as a true ether nephritis. In support of this belief he reports a case of nephrectomy in a child three and a half years old where no albumin was found after the etherization and operation.

The Treatment of Bone and Joint Tuberculosis. (*Archiv für klinische Chirurgie*, 1894, vol. xlix., No. 1.) By G. Neuber, M.D., of Kiel.

The author reports fifteen cases, of which fourteen are cured and one remains under treatment. In eight there was primary union, in four cases secondary union without suppuration, while in two cases there was a slight amount of pus. These results were obtained by the use of a ten-per-cent. glycerin emulsion of iodoform, which the author used for its well-known specific action in tuberculous cases. The author opens the joints, removes all fungous, tuberculous masses and necrosed tissues, washes out all the pus, removes necrotic bone and sequesters, and then pours over the entire tuberculous area a ten-per-cent. iodoform glycerin emulsion. After the joint has been opened and the diseased tissues removed he unites the joint capsule by a buried suture, the superficial tissues by an ordinary interrupted suture; the wound is not drained but firmly closed. Over the wound he lays a small amount of iodoform gauze held in place by adhesive plaster, and afterwards a dressing to hold the joint firmly in a fixed position. The cases so far include elbow, ankle, foot, and hip-joints. When a joint is only partially involved, after opening it, he puts into the sound portion a tampon of iodoform gauze; when all diseased tissues have been removed he washes out the wound, removes the gauze, and floods the whole cavity with iodoform emulsion, closing the wound by means of buried and superficial sutures without damage. The use of the same method in the treatment of other wounds he has found of value in securing primary union.

The Operative Treatment of Diseases of the Stomach. (*Archiv für klinische Chirurgie*, 1894, vol. xlviii, No. 4.) By Professor E. Küster, M.D., of Marburg.

The author divides the diseases of the stomach which require operative treatment into three groups: 1, perforative peritonitis; 2, stenosis of the pylorus produced by scar-forming neoplasms; 3, profuse and uncontrollable bleeding. The latter is the condition most seldom met with, and the author reports the following case in which not only was the bleeding arrested but a stenosis lastingly cured.

The patient was twenty-one years of age; had had diphtheria in childhood with irregular and suppressed menstruation. She had since December, 1889, attacks of continuous vomiting with cramps and unconsciousness, but had been free from them since October, 1890. She had been treated for the vomiting, but without very favorable results, and, as there was marked dilatation, she was turned over to the author for surgical treatment. The ex-

amination made showed a floating kidney, for which a nephrorrhaphy was done which produced good results, which however lasted but a short time. The patient returned, and a diagnosis of a neoplasm in the neighborhood of the pylorus, accompanied by bleeding that endangered the patient's life, as well as the stenosed pylorus which endangers the nutrition. At the operation the stomach was found to be enlarged and adherent at the thickened pylorus to the pancreas. An ulcer was found on the posterior wall of the stomach about the size of a fifty-cent piece; it was punched out, with overhanging edges. The pylorus could not be detected with the finger. The wound was enlarged, held open, and the whole surface cauterized by the thermocautery until the entire surface was burned. The upper portion of the jejunum was drawn up and united to the stomach throughout the length of a long opening, to prevent recurrent stenosis. Healing was delayed by an abscess in the abdominal wound. The patient, however, recovered completely fifty days after operation, there having been no recurrence of bleeding, and the patient had gained thirty-three kilogrammes in weight. This case illustrates the usefulness of cauterization in controlling bleedings from ulcers of the stomach, but it can be applied only where the thin wall of the stomach is adherent to some neighboring organ; in other cases resection will probably give better results. Gastro-enterostomy is useful in those cases where the scars are liable to produce stenosis.

The Surgical Treatment of Cancer of the Stomach. (*St. Petersburger medicinische Wochenschrift*, 1894, No. xlix.) By Dr. Klemm.

This author, after a careful review of the literature on this subject and a critical study of cases which have come under his own observation, draws the following conclusions: 1. The treatment of these tumors of the stomach differs in no respect from the treatment of carcinoma in any other situation, and is entirely surgical. 2. Early operation is to be recommended,—even before the tumor is palpable, if this is possible. 3. Examination of the patient should be made only during deep narcosis. 4. The exploratory incision may give the first definite diagnosis. 5. Those cases should be recommended for resection of the pylorus in which the tumor is freely movable and there is no surrounding metastasis. 6. Where these conditions are absent, a fistula should be formed between the stomach and the jejunum. 7. The knife should not be used as a last resort when the patient is enfeebled. 8. Such conditions would increase the mortality.

Experimental Craniotomy and Diagnosis of Cerebral Abscess. (*Lancet*, January 5, 12, 26, and February 2, 1895.) By Augusto Murri, M.D., of Bologna.

This exhaustive article, treating of the diagnosis of abscess of the brain from a clinical stand-point, and then from the surgical side, strongly advises the not infrequent necessity for an early exploratory trephining; for while in many cases an acute abscess of the brain may be diagnosed with some cer-

tainty, a chronic cerebral abscess may exist and yet may give rise to no positive indication of its presence,—too often, indeed, discovered only on post-mortem examination.

The diagnostic indications of a chronic abscess of the brain, while few and untrustworthy, are: the presence of a sufficient cause, such as middle-ear disease, local injury, caries of the cranial bones, or as a sequela of any of the specific fevers. While pyrexia, headache, and optic neuritis may be present, none of these can be depended on, for the temperature may be sub-normal and the optic neuritis be equally a sign of a tumor or meningitis, the headache, if localized and persistent and occurring after one of the usual exciting causes, is suggestive, but nothing more. Other symptoms, such as paralyses, though often of use in determining the situation of a lesion, are of no value in deciding as to its nature. A number of interesting and instructive clinical histories are given; several of these presented all the usual indications of a chronic cerebral abscess, and yet at the autopsy some other lesion was discovered.

As death results unless surgical aid be afforded, shall we wait until symptoms arise which will definitely satisfy us that an abscess is present? If so, it will in a large majority of cases be too late to operate; the abscess will have extended, and perhaps have ruptured either onto the surface of the brain or into one of the ventricles. The decision, which depends on the amount of danger connected with the operation, must consider the dangers of an early operation in finding in place of an abscess some other lesion for which he can do nothing, or of delaying until he is sure of his diagnosis, which delay may prove fatal to the patient. An editorial in the *Lancet* agrees with Murri that complete antiseptic precautions under the operation of an exploratory incision itself, if carefully performed, is practically free from risk, and it is seldom, indeed, that it is followed by any disastrous effects.

A Case of Ulcer of the Bladder. (*Journal of Cutaneous and Genito-Urinary Diseases*, December, 1894.) By Dr. Bangs and Dr. Vaughan, of New York.

The patient was an unmarried male, aged twenty-eight years. He denied venereal disease. In September, 1893, he began to complain of headache, chills and fever, and scalding on urination. He was obliged to urinate every half hour, the urine contained no blood. Examination revealed a stricture of the urethra which was cut internally, and the deep urethra was dilated. After this the bladder was irrigated regularly with boric acid solution and with silver nitrate solution (1 to 1000). This treatment made the patient worse; his temperature ranged from 99° to 101° F.; appetite was poor, and the urine contained pus. No tubercle bacilli were found after repeated and careful examination. Cystoscopic examination showed a distinctly outlined ulcer at the base of the bladder, about one inch from the neck. A solution of silver nitrate, one drachm to the ounce, was

injected and then neutralized with salt solution. The patient was put upon cod-liver oil and hypophosphites, and a few days later the cystoscope showed the ulcer in a stage of healing. The injections of silver nitrate solution were continued and the examination of the urine showed a few tubercle bacilli. Two months after his discharge the patient had suddenly a very severe hemorrhage from the bladder. He was put to bed, ergot given, and creolin solution used for bladder irrigation. The temperature at this time was normal. Shortly after this the patient had a chill and his temperature rose to 103° F. The bladder was irrigated with a (1 to 40,000) solution of bichloride of mercury, and from this on the patient improved. At the time of discharge the cystoscope showed only a congestion of the mucous membrane of the bladder; the patient could hold his urine for three or four hours during the day, and was seldom obliged to get up during the night.

A Hydatid Cyst occurring in the Sac of a Congenital Hernia. (*Australasian Medical Gazette*, July, 1894.) By G. Elliot Smith, M.B., of Sydney.

In a male subject, aged eighty-five, which was placed in the dissecting-room at the Sydney University, the funicular portion of the processus vaginalis was patent on both sides, a canal about as big as the two distal segments of a finger extending from the peritoneal sac through each inguinal canal. In the right process was a small, hard, spherical body, about three-quarters of an inch in diameter, and quite free and unattached. On section this body presented the appearance of a hydatid cyst which had been dead for some time. There was no sign of any other hydatid in the mesentery or in any of the abdominal viscera; but on the lateral aspect of the left side of the pelvis a hard, calcareous mass was felt under the peritoneum. This mass contained the characteristic putty-like material mixed with the semitranslucent débris of daughter cysts. Situated beside this mass was a small cyst enclosing the remains of the endocyst.

OBSTETRICS AND GYNÆCOLOGY.

IN CHARGE OF RICHARD C. NORRIS, M.D.,

Lecturer on Clinical and Operative Obstetrics in the University of Pennsylvania; Physician-in-Charge, Preston Retreat; Visiting Obstetrician, Philadelphia Hospital; Gynæcologist, Methodist Episcopal Hospital; Consulting Obstetrician and Attending Gynæcologist, South-eastern Dispensary and Hospital for Women and Children.

The First Symphyseotomies in America. (*Medical News*, January 26, 1895.) Editorial.

Dr. George M. Gould, in conjunction with Dr. R. P. Harris, has been investigating three symphyseotomies performed by Dr. J. O. Williams, of William Penn, Texas; the first on April 29, 1880, at Denison, Texas; the

second on July 15, 1884, in Washington County, Texas; the third in May, 1889, in the same house as in the second case. The first operation is thus described: "During 1879 Dr. Williams, then of Denison, Texas, was consulted by a girl, thirteen years of age, and also by her mother, in reference to the child's pregnancy. They demanded that an abortion should be produced. This was refused, and by a solemn promise of absolute secrecy Dr. Williams succeeded in getting *their* promise to allow the pregnancy to come to term, upon the condition that he would then secretly deliver the child, etc. This was done on April 29, 1880. The girl had been in 'violent labor' for eighteen hours, and delivery was only possible by means of the idea, spontaneously occurring to Dr. Williams at the time, of separating the pubic bones by means of a tenotomy-knife. 'With one hand the clitoris was depressed to the right side and the blade made to enter as centrally as I could direct, until the point came in contact with the bone. It was then forced upward along the front until the superior margin was reached. I grasped the knife between my fingers and thumb, and, as forcibly as I would risk, drew the blade along the symphysis. The bones yielded and very gently separated before the blade had traversed the entire extent. The bones parted, so that I could depress the overlying tissues and the ends of my fingers between them. I now had no trouble in applying the forceps and delivering the child, which weighed twelve pounds. The mother and child did well.' Dr. Williams then went to a dressmaking establishment and gave directions for a laced abdominal and pelvic band, or bandage, which was 'applied and was worn for the remainder of the time that I had the patient under charge, probably a month or six weeks.'

"In connection with this case it will readily be seen, that the details of names, the exact place of the operation, the street number, etc., cannot be published if the promise of Dr. Williams is to be kept. The interested persons still live, and any such disclosure would at once result in tragedy. But we have in our possession every particular necessary to establish the absolute accuracy of the foregoing report of facts, and can unqualifiedly vouch for their truth as given."

As the particular reasons for secrecy do not exist in the second and third cases, they are given, with proofs as to names, addresses, dates, etc. The following remark of Dr. Harris is quoted in this connection at the end of the article: "*In your reports and statistics, wait until you hear from the backwoods.*"

Premature Delivery of a Dead Child, induced by Acute Appendicitis, with Remarks on Appendicitis in Women. (*New York Medical Record*, December 1, 1894.) By Paul F. Mundé, M.D., of New York.

A woman in the eighth month of pregnancy was seen in active labor; her temperature, at the time of the first visit, was 104° F., pulse 140. The patient had been ill for six days, the attack beginning with fever and pain and tenderness in the lower part of the abdomen. The morning before

the patient was first seen she was seized with atrocious pains in the pelvic region, accompanied by a chill, temperature 101.5° F., and the commencement of labor pains. About eighteen hours after the outset of labor pains the patient was delivered of a fœtus which had been dead twenty-four hours. Twelve hours after delivery, dulness could be distinguished in the right iliac region together with very acute pain on pressure; though immediately after delivery the abdomen was so universally tender that no reliance could be placed on the location of pain as an aid to diagnosis. Six days later an appendical abscess was opened and drained. Convalescence was practically uneventful. The death of the child was due to the high temperature, and the premature labor was due to the efforts of the uterus to expel its dead contents. In future the author would open the appendical abscess at once. In the past, women have been considered immune from appendicitis because, in the anti-operating days, inflammations in the right iliac region were looked upon as "pelvic cellulitis" or peritonitis, and the incorrectness of the diagnosis was never exposed because there was no autopsy or because the abscess opened into the bowel and the patient recovered. In every case of inflammatory exudate or suppuration in the right half of the female pelvis, particularly if the exudate extends as high as or higher than the crest of the ilium, the primary cause of the exudate may be an appendicitis. If the appendages are healthy and the exudate is due to inflammation of the vermiform appendix, the finger, *per vaginam*, will find the right vaginal vault empty, the uterus normally movable, and the exudate not reachable from below. If the exudate extends above the crest of the ilium it may be of perinephritic origin.

A New Operation for Procidentia Uteri. (*American Journal of Obstetrics*, December, 1894.) By Dr. E. C. Dudley.

The author describes a new operation for procidentia uteri, which he terms lateral elytrorrhaphy. The operation is performed with the patient in the Sims's position and with the vagina exposed by means of a Sims's speculum, the blade of which had been perforated at its extreme end. Before the speculum is introduced the cervix is attached to the end of its blade by means of a temporary suture, which is passed through the posterior lip of the cervix and through the perforation in the speculum and tied. This enables the operator to dispense with the sponge probang described by Emmet, and which is objectionable since it obstructs the operator. This suture should be removed at the end of the operation. When the cervix is thus held in its normal location by the speculum, the space anterior to the uterus is so increased that that organ readily falls forward into a position of decided autoversion. The first step in the operation proper is to denude two semicircular strips in the vaginal wall close to the uterus and on either side of it about one-third of an inch wide, their concavity being toward the cervix. Each denuded surface is then closed upon itself by means of silkworm-gut sutures. The folding of the denuded surfaces upon them-

selves lifts the cervix bodily upward and backward. Next, two strips about a quarter of an inch wide are denuded, extending along each lateral sulcus of the vagina from the lower point of the former denudation to the vaginal outlet, terminating on either side of the orifice of the urethra. The lateral edges of each of these denuded surfaces are now brought together by means of sutures passed obliquely across the denuded strip. One side of each of these denuded strips is adjacent to the anterior vaginal wall and the other side is adjacent to the posterior vaginal wall. Upon tying these obliquely placed sutures the redundant margin of the wound, produced by sliding the anterior wall upon the posterior, is disposed of. The effect of this method of suturing when applied to both sides of the vagina is to slide the anterior vaginal wall upward and backward on the posterior vaginal wall and fix it there. The cervix uteri, being in the anterior vaginal wall, must participate in the upward and backward movement. The author has performed the operation for three years with permanently good results. The operation restores the upper extremity of the vagina and of the anterior vaginal wall to its normal location and direction, and thus the cervix uteri is forced backward to its normal location near the hollow of the sacrum and the remainder of the uterus falls into its normal anterior position.

NEUROLOGY.

IN CHARGE OF LANDON CARTER GRAY, M.D.,

New York City,

GUY HINSDALE, M.D.,

Philadelphia,

AND

WILLIAM BROADDUS PRITCHARD, M.D.,

New York City.

A Case of Cardiac Epilepsy. (*New York Polyclinic*, December, 1894.) By William Broaddus Pritchard, M.D., of New York.

A Jewess, aged twenty-three, complained of sudden attacks of severe palpitation of the heart, attended with vertigo, occurring irregularly and without warning. These attacks were most frequent early in the morning, after awaking, but before rising. The family history showed one death from meningitis and one from suicidal insanity. One member of the family is an epileptic. The parents were neither neurotic nor tubercular. The patient was frail and anæmic, but had never suffered from serious illness, nor was she hysterical. During the attacks the patient would at first become quite pale, then flushed, and then dazed; but there was never a loss of consciousness, and no motor spasm was observed until three weeks after the case came under observation. At this time there was a general twitching of all the extremities and of the facial muscles following the onset of the symptoms above described. At this time, also, consciousness was lost. The minor attacks became less frequent under treatment, but the patient had two other attacks with distinct motor spasm after the first one

was observed. These attacks were accompanied by cardiac pain. After marriage and pregnancy, the attacks of *grand-mal* increased in frequency, as did the attacks of *petit-mal*. Repeated physical examination had failed to demonstrate any heart lesion. The pathogenesis of the case cannot be demonstrated satisfactorily. The treatment consisted in the administration of the bromides, digitalis, and strophanthus.

Post-Epileptic Automatism. (*Birmingham Medical Review*, November, 1894.) By A. Douglas Heath, M.D., of London.

The first case of post-epileptic automatism reported occurred in the person of a boy, fifteen years of age. This patient had been subject to epileptic fits from an early age. At the time of observation the patient was watched for more than a half-hour. He was first noticed rushing wildly along the street, muttering to himself, and then, suddenly coming to a stand, he would shout something that nobody could understand, and seemed to be looking for some article which he had lost. Once he attempted to take off his coat, and appeared angry when the attempt was resisted. In the physician's office he walked rapidly about, talking rapidly and incoherently. He would seemingly carefully examine objects in the room, and once he picked up a cloth and began to polish a brass tap. The boy had frequently stolen things during his "unconscious spells."

The second case was in the person of an unmarried woman, twenty-eight years of age, who had had "fits" since she was nineteen years old, and who, before that time, had been subject to bad attacks of giddiness. She had gone to bed leaving a lamp burning in a far corner of the room. About an hour afterwards her friends found her standing by the lamp with her night-dress on fire and in a dazed condition.

OPHTHALMOLOGY.

IN CHARGE OF CHARLES A. OLIVER, A.M., M.D.,
Philadelphia, Pennsylvania,

AND

EDMUND LANDOLT, M.D.,
Paris, France.

Experimental Investigations on the Staphylococcus Ulcer of the Cornea, and Therapeutics. (*Transactions of the Eighth International Ophthalmological Congress.*) By Ludwig Bach, M.D., of Würzburg, Germany.

In order to prove experimentally whether subconjunctival injections of bichloride of mercury possess any therapeutic value, Bach has made a series of interesting experiments. He first produced an ulcer on each

cornea of a rabbit by forming a pouch and inoculating it with a pure culture of *staphylococcus pyogenes aureus*. Both ulcers were treated by atropine, but one eye (always preferring the one with the less intense ulcer) received conjunctival injections of corrosive sublimate according to the directions given by Dr. Darier. As a result of this treatment, he found the eye that received the injection increased in irritation and the duration of the condition was prolonged, thus bringing him to the conclusion that absolutely no therapeutic value can be attributed to subconjunctival injections of corrosive sublimate, and that the favorable results previously reported (mostly based upon clinical observations) are to be regarded as erroneous.

From a bacteriological stand-point, he says, "Where the ulcer of the cornea has not led to perforation, the use of subconjunctival injections of corrosive sublimate is quite out of the question, for in these cases no micro-organisms are to be found in the hypopyon or in the iris and ciliary body." In proof of this, he asserts that a number of former observations are at hand. From numerous experiments—sucking up of the hypopyon and implanting it in culture media—he believes that this assertion is irrefutable.

He asks what then is the use of sublimate in the eye, if no bacteria are present which it could destroy? It could only exercise an injurious chemical influence. He says, supposing that an amount equal to one-third divisions of a Pravaz syringe injected into the conjunctiva were received by the lymphatic ducts, how can one know how much of it would reach the eye? What dilution of the concentration would take place? He says that assuredly such a considerable one that the staphylococci existing in the iris, in the ciliary body, or in the cornea, would suffer no inconvenience from it. He further remarks that it still remained for him to contradict with all positiveness that even in infected penetrating wounds of the eyeball (in fact, in all diseases of the globe where micro-organisms are present or supposed to be present) and, further, in all diseases of the eye which can with certainty be traced to venereal disease, the subconjunctival injections of corrosive sublimate can be absolutely of no use. In order to prove this, he found that a chemical examination of the contents of the eye was necessary. This he first extended to eyes where from one to six divisions of the before-named sublimate solution had been injected under the conjunctiva, and then to such as had been laid *in toto* in a sublimate solution of one to two thousands or one to one thousand. He says that, although the chemical examinations now made by Dr. Gürber were sufficient to detect the $\frac{1}{200}$ milligramme of sublimate, yet in not one of the eyes in which sublimate had been injected under the conjunctiva could a trace of corrosive sublimate be found. Further, he found that even in eyes which had lain *in toto* in a solution of sublimate one to one thousand on an average for twenty-four hours, only little reached the interior of the eye. He believes that the investigations of Sgrosso and Scalingi on this subject rest on an absolutely useless method, and are not such as merit serious consideration.

Passing on, he touches upon another variety of treatment of the septic corneal ulcer, the washing of the conjunctival sac with corrosive sublimate. He remarks that, as the repeated washing of the conjunctival sac with sublimate (1 to 3000 or 1 to 5000) is frequently performed in septic corneal ulcers, it is supposed that the sublimate would have effect on the micro-organisms contained in the conjunctival sac and then on the microbes contained in the cornea. He emphatically states that the latter supposition is unfounded, and offers the following experiments as furnishing the proof. The uninjured cornea of a rabbit was irrigated with corrosive sublimate (1 to 3000) under moderate pressure for five minutes, and then after appropriate precautions had been taken, it was examined. No sublimate could be found in the cornea. Further, the corneæ, in which various deep and extensive loss of substance had been produced, were treated and examined in the same manner; in these a small quantity of sublimate could be found. Again, corneæ with artificially-produced staphylococcus ulcers were irrigated in the same way, and then the bacteriological examination made. In no case were the inoculated staphylococci successfully destroyed, even when the inoculation took place immediately before the disinfection.

In accordance with these findings, he believes that flushing of the conjunctival sac with sublimate is to be condemned. He says that its utility consists only in the mechanical washing away of germs and their products, and that its influence on the virulence of the remaining germs is not to be considered. He states that the above effect is also obtained by the use of neutral non-irritating fluids. Based upon clinical experience and the showing of microscopic preparations, he objects to the scooping out of septic corneal ulcers by means of sharp spoons or other suitable instruments. He believes, however, that in many cases it may be of use, but says that now and then the micro-organisms are thereby pressed into the previously free spaces. He has found that red heat acts with much more certainty in destroying the bacteria existing in the cornea, asserting that as often as he has cauterized an ulcer, the subsequent bacteriological examination was not able to prove the existence of staphylococci.

Treatment of Traumatic Cataract attended by Rapid Swelling of the Lens. (*Annals of Ophthalmology and Otology*, January, 1895.) By James Moores Ball, M.D., of St. Louis, Missouri.

In a praiseworthy and practical article upon this subject, Ball says that: "In cases of traumatic cataract, with rapid swelling of the lens, an operation should be performed; and that operation should be, not linear extraction as has been the rule heretofore, but an extraction made with the Graefe knife, the incision being located in the corneo-scleral junction. The knife should cut from one-third to two-fifths of the corneal circumference, according to the extent to which the softening process in the lens has advanced. If glaucomatous symptoms supervene, with softening of only a small part of the lens, the corneal incision should be large; if the soften-

ing involve the whole lens, the incision should be of less extent." He thinks that the extent of the incision of the cornea is of little importance provided we make an aseptic operation. The chief merit of the operation which he advocates lies in the avoidance of the valve which is produced by the linear method; in other words, his method in these cases permits the free evacuation of all the lenticular substance with the least amount of traumatism. An iridectomy is not made. All the *débris* is removed at once. This cannot be accomplished, he says, by the linear method.

Retinitis Pigmentosa. Report of a Case. (*Annals of Ophthalmology*, January, 1895.) By Dunbar Roy, M.D., of Atlanta, Georgia.

As the result of an extended study of the etiology, symptomatology, prognosis, and treatment of this disease, Roy expresses his opinion in the following beliefs:

1. *Retinitis pigmentosa* is an atrophy of the retina followed in the later stages by a deposit of pigment beginning usually in its deeper layers.

2. Its most prominent symptoms are: (a) hemeralopia or night-blindness; (b) contraction of the field of vision for all colors; (c) the appearance in the fundus oculi of pigmented spots in the shape of "bone-corpusele," especially towards the periphery.

3. It is a disease in the majority of cases hereditary, and especially if there is a taint of consanguinity in the family.

4. The treatment seems to be powerless, but those remedies should be used which are nervines and alterative tonics.

DERMATOLOGY.

IN CHARGE OF W. A. HARDAWAY, A.M., M.D.,
Professor of Skin-Diseases in the Missouri Medical College, St. Louis;

ASSISTED BY

C. F. HERSMAN, A.M., M.D.,
St. Louis.

Two Cases of Epidermolysis Bullosa.—Elliot (*Journal of Cutaneous and Genito-Urinary Diseases*, January, 1895) reports two cases of the rare affection which has been called *epidermolysis bullosa*. The first case occurred in a male, aged thirty, whose father had suffered from a similar trouble. The disease first manifested itself when the patient was five years old. The lesions occurred as tense, deeply-seated bullæ which appeared after irritation, such as rubbing the parts, or from the use of instruments such as a hammer or a screw-driver. The lesions affected only the hands and feet, and were more apt to occur in summer. The patient suffered from hyperidrosis of the hands and feet, and often there was a bromi-

drosis of the latter, the contents of the bullæ being at times offensive. The bullæ were not surrounded by any redness, nor were other clinical signs of inflammation to be noted. The only subjective symptom was pain after the bullæ had ruptured. The second case occurred in a male twenty-one years old. There was no history of hereditary predisposition. The cutaneous trouble had existed ever since the patient could remember. The lesions were similar to those seen in the other case, but developed upon any part of the body from even the slightest friction, as the rubbing of the suspenders. This patient was affected with general hyperidrosis, and the skin trouble was worse in summer. In neither of the cases was treatment of any avail. The author made microscopical studies of fresh bullæ and found evidence of inflammatory infiltration about the vessels of the cutis, and he regards the malady as a dermatitis developing in an individual with an acquired or hereditarily exaggerated irritability of the cutaneous vascular system.

A Case of Tuberculous Lymphangitis.—Cahill (*British Journal of Dermatology*, January, 1895) records a case of lymphangitis of tuberculous origin which occurred in a woman fifty-two years of age. The patient had always enjoyed good health till she was affected by her present trouble, and there was no family history of any tuberculous disease. Twelve years before the first examination she had noticed upon the heel of the left foot a rough tender spot as large as a sixpence, which she described as a corn. For fully five years this corn remained quiescent, not causing any trouble beyond a little soreness when it was rubbed by her shoe. At the end of this period there began to form, first at the site of the corn, fleshy nodular masses which gradually extended up the back of the leg and then to the instep. Two years after the disease had begun to extend on the foot a swelling was noticed over the metacarpo-phalangeal joint of the right forefinger; ulceration followed which extended over the back of the hand and wrist, while the finger became stiff and useless. At the time of the examination the foot and ankle were found swollen and stiff from a brawny œdema. The lesions of the skin consisted of irregular nodular masses of a deep-red color and firm consistence which were grouped together into patches. These patches were found on the dorsum of the foot, along the front of the leg as high as the knee, and up the back of the leg. On the heel and at the instep the diseased skin was ulcerated in places and there exuded an ichorous discharge. On the right hand there were two sinuses on the back and two on the palmar surface leading down to the metacarpo-phalangeal joint of the index finger. The skin of the index finger was much thickened and in places ulcerated. There were several indolent ulcers on the back of the hand and wrist. Two inches above the elbow on the inner side of the left arm was a hard subcutaneous mass as large as a walnut freely movable under the skin. All other portions of the body were healthy. A microscopic examination of one of the nodules showed it to be made up of a

small-celled infiltration with giant cells, but no tubercle bacilli could be demonstrated. The author does not consider that this latter fact throws doubt on the diagnosis, as it is well known that Koch's bacillus is often not found in lupoid tissue of old formation. Dr. Pringle adds some notes to the clinical history of the case. He is of the opinion that the case is one of tuberculous lymphangitis, and regards the "corn" from which the disease seems to have had its origin as probably a verrucose tuberculosis.

[In any chronic obstruction of the lymphatics it is common to have an elephantiasic condition developing in the affected tissues. This is one point of evidence that the lymphatics are really affected. Another evidence of such involvement is to be able to withdraw from the nodules or varices lymphatic fluid. It is to be regretted that no mention of such a phenomenon is made in this case.]

Serotherapy in Syphilis.—Richet (*Medical Week*, January 18, 1895) reports two cases of syphilis treated by serum from a dog which had been inoculated with syphilitic blood a week before. The serum was first tried on a woman who had had syphilis twenty years before and who presented symptoms of tabes. Under the serum the symptoms entirely disappeared. The second case was a woman who had contracted syphilis a year and a half previous to the treatment. She had extensive ulcers which had resisted ordinary antisyphilitic treatment. After seven injections of dog-serum the ulcers had decreased in size by four-fifths.

PATHOLOGY.

IN CHARGE OF ALLEN J. SMITH, A.M., M.D.,

Professor of Pathology in the Medical Department of the University of Texas, Galveston, Texas,

AND

HENRY W. CATTELL, A.M., M.D.,

Demonstrator of Morbid Anatomy in the University of Pennsylvania; Prosecutor to the American Anthropometric Society; and Pathologist to the Presbyterian Hospital, the Institution for Feeble-Minded Children at Elwyn, etc.

Experimental Pyelonephritis resulting from the Injection of Living and Dead Bacteria into the Pelvis of the Kidney. (*Fortschritte der Medicin*, December, 1894.) By Schnitzler and Savor.

The results obtained by these authors, in a series of interesting experiments upon dogs, go to show that there are not pyogenic and non-pyogenic micro-organisms, but all we can say is that in certain circumstances certain micro-organisms are capable of producing pus. The injection of dead bacteria, especially *proteus vulgaris*, did not produce visible suppuration in the kidney; a round-cell infiltration was, however, noted, although there was no necrosis of tissues and breaking down of structure. A difference in the amount of change and not in the kind was therefore determined.

Their research proved an interesting fact, that the unwounded epithelium of the pelvis of the kidney and ureters is no protection against the influence of dead micro-organisms; for their experiments demonstrate that dead bacteria injected into the pelvis of the kidney can produce a diffuse interstitial nephritis.

Investigations concerning the Etiology of Small-Pox. (*Medical News*, January 26, 1895.) By J. Christian Bay, M.D., of Des Moines, Iowa.

After a short but excellent historical sketch of the work which has already been done in attempting to isolate the organism of small-pox, the writer describes the *dispora variolæ*, discovered by himself. This organism, which he considers to be the specific cause of the disease, has the same appearance as the one described by Plaut. It is a colorless, non-motile bacillus, with a long diameter measuring from $0.6\ \mu$ to $1\ \mu$, and the short diameter from $0.2\ \mu$ to $0.3\ \mu$. Already at the beginning of the development the bacilli show the presence of spores, one at either end. This organism was found, with three exceptions, in examinations of sixty-five cultures from vaccine-points, and in one case in the lymph from a case of confluent small-pox. Of forty cultures in bouillon made from this lymph, only two failed to show the presence of the bacillus. Bay believes that the spores are the main source through which both variola and vaccinia are reproduced.

Formol as a Fixing Agent. (*Fortschritte der Medicin*, 1894, vol. xii., Nos. 20 and 21.) By M. Reimar, M.D., of Halle.

From a careful comparison of the action of this drug in solution with that of other methods of hardening in connection with all tissues, this author concludes that formol is one of the best of hardening drugs, and that it preserves the tissues in a condition nearest to the normal, and, although it is not of universal application, still it is to be recommended in all examinations of tissues that different modes of fixation be employed, since all substances are not universally applicable and produce better results in certain tissues than in others, and by comparison one can judge better what is the true or normal structure and its best picture. Formol is especially useful as a fixing medium for pathologically altered tissues, where a rapid fixation gives better results, and especially in large pieces it rapidly saturates and does not, like alcohol, produce alterations, as, for instance, the production of false images in homogeneous egg albumen, producing nuclei or fissures where none exist. It is also comparatively inexpensive, a four-per-cent. solution costing about twenty-five cents a litre, and can be used over and over until it becomes unclean from blood or fragments of tissues.

MISCELLANEOUS.

Defective Vision in its Relation to Crime. (*American Medico-Surgical Bulletin*, November 15, 1894.) By Frank Van Fleet.

The writer believes that, while the influence of heredity in the production of crime is more than doubtful as a factor in criminology, environment as manifested by defective vision is of the utmost importance. The proportion of crime and criminals to population is increasing. Education not only increases crime but causes it, while manual labor diminishes it. "As certain thoughts will be expressed by certain movements of the face, as grief, joy, recognition, etc., which movements are due to involuntary or reflex muscular actions, so people who are accustomed to think in certain lines after a while become to look alike. Physicians resemble each other; lawyers, cobblers, tailors, and, in fact, nearly every class of professional men and artisans, have certain actions and expressions, due to their habits and ways of thinking, that distinguish them one from the other. . . . Certain it is, that where certain customs have been exercised, both as religious rites and otherwise, as, for example, among the Arabian, Jewish, and other races, where circumcision has been practised since time out of memory, the effect had not been different on the offspring than in races where it has not been done. The Jewish race, especially, where circumcision is practised as a religious rite in the early days of infancy, and where selection is made in mating, at least to a certain extent, would seem to offer the conditions necessary, yet we find these children not different at birth from other children."

Van Fleet says, in summing up his conclusions,—

"It is very probable that the human race has altered very little, if at all, since the beginning. There is nothing but theory, and that very far-fetched, to prove the opposite. At any rate, there has been no change since the earliest time known to history. The surroundings, however, are very different. From being creatures of purely physical development we have become creatures in whom intellect predominates. Our anatomy has not kept pace with the physiological requirements. Spectacles are not evidence of growing physical weakness, but rather of increased intellectual growth. Our eyes are merely the principal avenues through which intellectual food is acquired. If all individuals were alike, and all eyes imperfect, the conditions would be more nearly equal. It happens that very many eyes are as perfect as it is possible for eyes to be, and they confer on their possessors an immense advantage. Man always takes advantage of his weaker brother, who is obliged to resort to other measures in self-defence; if the measures he employs are legal, well and good; if they are illegal, he becomes a criminal. Do not misunderstand me. Crime has many causes, many features. Defective vision may not be in itself alone sufficient to make a man a criminal, but its influence is great and deserves careful consideration."

FORENSIC MEDICINE.

IN CHARGE OF LORENZO D. BULETTE,
Of the Philadelphia Bar.

THE PHYSICIAN ALONE TO JUDGE OF THE NECESSITY OF FREQUENT VISITS.

In an action¹ brought by a practising physician to recover the sum of four hundred dollars for professional services rendered to the defendant's family, the evidence showed that during a period of thirteen months the plaintiff had visited and prescribed for defendant's family, more or less sick, sixty-six times; but it did not appear that the plaintiff was specially requested by the defendant to make more than a dozen visits, or that the defendant was aware of all the visits charged. The defendant, however, knew that the plaintiff was visiting his family and made no objection.

On an appeal from a judgment in favor of the plaintiff for the amount of his claim and costs, it was contended that a physician, to maintain an action for professional visits to a patient beyond those specially requested, must show some reasonable necessity for such additional visits; as in this case sixty-six visits are charged for, while twelve only were requested, and there is no evidence whatever that the others were necessary. It was argued for the plaintiff, on the other hand, that when a physician undertakes to treat a patient he impliedly contracts to give him reasonable care and attention; and if he fails to do so, he becomes liable for any damage which may result from his negligence.

On this state of facts the Supreme Court said, "The defendant having admitted the employment of the plaintiff as a physician to treat his wife and children, the plaintiff was the best and the proper judge of the necessity of frequent visits, and in the absence of proof to the contrary, the court will presume that all the professional visits made were deemed necessary and were properly made. It would be a dangerous doctrine for the sick to require a physician to be able to prove the necessity of each visit before he can recover for his services. This is necessarily a matter of judgment, and one concerning which no one, save the attending physician, can decide. It depends not only upon the condition of the patient, but in some degree upon the course of treatment adopted."

¹ Todd vs. Myers, 40 Cal. 355.

BOOK REVIEWS.

THE INSANITY OF OVER-EXERTION OF THE BRAIN; BEING THE MORISON LECTURES, DELIVERED BEFORE THE ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH, SESSION 1894. By J. Batty Tuke, M.D., F.R.C.P.E., F.R.C.S.E. With Illustrations and Diagrams. Edinburgh and London, 1894.

The five lectures constituting this little volume were originally published in the *Edinburgh Medical Journal*, and have attracted wide-spread attention. Their author is an original worker and thinker, and has contributed many valuable facts and suggestive hypotheses to psychological medicine. The effort is made in this volume to account for the causation and to provide a treatment for the acute forms of insanity on principles which have received their exposition in the histological work of such men as Golgi, Ramon y Cajal, Retzius, and Lloyd Andriezen. The studies are particularly directed to the elucidation of the question of over-exertion of the brain in the etiology of insanity. The wonderful observations of Hodge on the effects of stimulation of nerve-cells are made use of as a foundation for some of the views propounded. The lectures throughout show the work of one who is a practical alienist as well as a microscopical investigator. The weaknesses of the old method of the classification of insanity by symptoms is exposed; also the great advance in psychiatry, when causation was adopted, or partially adopted, as a basis of classification, but at the same time the author does not fail to see the fallacies of etiological methods, and the impossibility of entirely relying upon them.

He calls attention to a simple fact, and yet one the importance of which is commonly overlooked,—that while many of the cerebral convolutions are known to have definite sensory, motor, or other functions, in other words, are capable of acting as organs with definite ends, yet these, like the other organs of the body, are not visualized as such. He constructs a diagrammatic scheme of a convolution as such an organ, founded upon the recent histological researches.

In dealing with the anatomy of a convolution he says, "I trust it is fully understood that it is not my intention to endeavor to work out the dynamics of a delusion. My purpose is much more humble, being simply to demonstrate how the normal economy of the apparatus may be implicated by the action of disease, and consider how we may best help restore healthy relations. As yet the chemistry and mechanics of psychical processes are matters of surmise and theory; all we can say is, that mental action is a function of connections, or, as Obersteiner puts it, 'The gray matter is a field for the association of afferent sensory impulses. In it they are placed in communication with efferent paths, along which they travel immediately or at some subsequent time; or to speak more correctly, the efferent impulse is not the unchanged afferent impulse directed into a descending path, but the product of afferent impulses just received, combined with impulses liberated from their resting-places in the tissue of the brain.'"

The views of Meynert, Golgi, Ramon y Cajal, Obersteiner, and others are summarized in a felicitous manner. The method of production of functional hyperæmia from cerebral over-exertion is presented, recording the experiments of Mosso, Moxon, Milne-Murray, and others; also personal observations of the effects of psychical activity and fatigue, and the experiments of Roy and Sherrington, who introduced

acid brain filtrates in the cerebral circulation and found that they produced hyperæmia.

Great stress is laid upon the fact, the result of personal as well as other investigations, that the earliest and most marked changes in the cortex and membranes in cases of insanity are in the pia of the Rolandic region and in the pyramidal cells of the same zone. An explanation of this is believed to be found in the fact that the excitement which attends an over-used and over-fatigued brain finds its first expression in this region, which is the one where brain activity reaches its highest exposition.

Much of his view of pathogenesis is expressed in the following sentences: "I think that given functional hyperæmia passing into congestion and acute inflammation, we have every reason to believe that the lymphatic flow is interfered with, and that the brain must suffer in respect of functional activity and solutions of continuity of structure.

"No one reading Bevan Lewis's chapters on Pathology can fail to be struck by the frequent reference to inflammatory changes affecting bone, membranes, and nerve-fibres. Let us take his remarks on the pia: 'The pia mater is abnormally thickened in fully forty-eight per cent. of those dying insane, partly from fibrinous exudates which have organized, partly from plastic lymph, and often from an œdematous swollen condition of the conjoined soft membranes.' In like manner he refers changes in the skull and dura to inflammation, and, as we have seen, he speaks of colloid bodies and 'miliary sclerosis' as incidents occurring in the course of sub-inflammatory action. I prefer to take this book because it is the most authoritative work on the subject in our language, notwithstanding that its author expresses no opinion as to the existence of sub-inflammatory changes in the early stages of 'acute mania' and 'acute melancholia.' He generally speaks of changes spoken of as being the result of old standing inflammation; the meaning of which I infer to be that it occurred at a very early stage. Certainly the forty-eight per cent. included general paralytics; but that leaves a fair margin for cases of terminative dementia due to other causes of insanity. But in the presence of distended and congested vessels, leucocytes in the perivascular canals, and exudation, we have direct evidence of inflammatory action in all cases which had been the subjects of acute mania or acute melancholia."

Tuke takes the ground as to the methods of initiation of the so-called pure insanities that "impairment of the vaso-control system consequent on nerve implication is the efficient factor in producing reduction of general functional activities."

He holds that the sequence of pathological events in the development of sub-acute mania and melancholia is as follows: "Acute congestion and nerve waste, productive of active symptoms, which, if not relieved, is followed more or less rapidly by weakened action of the glandular systems and consequent deterioration of function of the alimentary canal and implication of the blood; and as a condition of nervous congestion and stasis is reached we have to deal with a further reduced functional activity, not only of the organ primarily affected, but also of the various systems which it governs. Nerve-waste has reached its minimum capacity for loss, as indicated by oxaluria and phosphaturia."

He arrives at the following conclusions: "First, that over-exertion of the areas of the brain which form the substrata of consciousness produces changes in anatomical and physiological relations evidenced by trains of physical and mental symptoms; second, that the primary change is congestive in character; and, third, that secondary changes may be produced resulting in impairment of the systems of connections and permanent insanity."

The relations of menstruation to mental disease and of mental disease to menstruation are ably discussed. He takes the ground, forced upon every thoughtful alienist after a fair experience, that the menstrual like the mental malady is usually

part of the general morbid train or chain, and that the former does not hold the relation of cause to the latter. This is a most important fact to remember in the light of etiological methods of treatment. The broad and stable position is taken, that while insanity is often associated with special diatheses, like the tubercular, rheumatic, gouty, and syphilitic, it is not to be attributed to the diseases of individual organs.

His chief deductions as to treatment are, in the first place, that the abnormalities present must be attacked through the organ primarily affected, and, secondly, that the first object to be attained is rest for the brain.

The methods of treatment based upon his investigations are simple but philosophical. In the early and in the acute stages rest in bed is of paramount importance. Opiates and narcotics and hypnotics in general are not to be used except in extreme cases. Counter-irritation, as by hot poultices or sinapisms, alternately to the chest and to the spine are strongly commended. Frequency in the administration of food and a plentiful meal at night are strongly endorsed. Of drugs, digitalis is given the highest place, and is recommended in comparatively large doses. He suggests that, as neurine is probably the morbid product in the blood which produces the most distressing symptoms of fatigue and the exudates due to congestion, the beneficial effect of digitalis may be in part due to its diuretic powers, as such toxic substances are most readily got rid of by way of the kidneys. Antipyrin exercises a beneficial effect in cases which show a persistent slight evening rise of temperature. Massage is useful, but should not be used after six in the evening, although head and neck massage may prove useful at any time; warm baths and mild cathartics are also advised. In cases which resist these methods of treatment, it may be necessary to give hypnotics, and of these paraldehyde holds the first place with him. Only after improvement has begun are nervine tonics to be resorted to, and those he recommends most are the preparations of the phosphates and arsenical preparations; and with returning health, change of scene, amusement, and occupation become of great importance.

This volume will prove of great value to every practising physician, as well as to every alienist, both for its suggestions and the measures of treatment advocated.

C. K. M.

A CLINICAL MANUAL OF DISEASES OF THE EYE, INCLUDING A SKETCH OF ITS ANATOMY. By D. B. St. John Roosa, M.D., LL.D., Professor of Diseases of the Eye and Ear in the New York Post-Graduate Medical School and Hospital; Surgeon to the Manhattan Eye and Ear Hospital, etc. Large 8vo, pp. xx, 621. New York: William Wood & Company.

A man going along the sea-shore of course can fill his pockets with the shells and stones that, for his own use and amusement, he may think are the most beautiful and most valuable, but if the collection is intended for the proper education of others in this subject, it does not seem right or proper that he should allow some of the handsomest and most important of the objects for the elucidation of the subject to be cast aside and ignored for teaching purposes. So here, the author, without the least criticism from others, may burden his own brain with any particular beliefs or notions that he may deem the most useful for his individual purposes, but when he says that he trusts that he shall have offered a book of such a nature that it may "be found a complete and safe guide to the practitioner," he has most emphatically failed of the written purpose. Books of an educational character, such as has been offered, to be "complete" and "safe" guides must necessarily embrace all of the most important and useful work that has appeared in ophthalmological literature. This the book emphatically fails to do.

The author's invitation for an impartial hearing to the particular part of the volume for which he is chiefly responsible—that is, the "Conditions of the Eye Requiring the Use of Glasses, Errors of Refraction and Accommodation, Strabismus,

Affections of the Ocular Muscles"—is best criticised in his own prefatory words. "Those which are true will form a part of an indestructible structure that is still, as it has been for centuries, in process; those theories which prove to be false will speedily be rejected as not fit for the builder's use." Prophetic words: much that is designated as true and worthy of example in this part of the volume has already been proved to be false and has been rejected; much that is here is not fit for the uninformed reader.

It seems a pity that the good work of others in the book, especially the anatomical portion, by Dr. Davis, should be here buried. This, however, must be considered simply in the light of a misfortune.

The subject-matter exhibits both haste and carelessness. Hibernicisms, as for example upon page 133, where really blind patients are said to be able to see their own hands by simply knowing that they are held in position, are not rare. Diagrammatic errors, as for instance Fig. 46, which is a reproduction of Berry's incorrect diagram of the visual angle, are not infrequent.

Taken as a whole, the work can only be recognized by any broadly-educated ophthalmologist as one that needs a total and unbiased revision before it can be conscientiously recommended as of any value to the general reader and the uninformed student.

PREScribing AND TREATMENT OF THE DISEASES OF INFANTS AND CHILDREN.

By Philip E. Muskett, late Surgeon to the Sydney Hospital. Third edition, revised, enlarged, and rearranged. Pp. 334. Edinburgh and London: Young J. Pentland.

The second edition of this work having been out of print for some time, the demand for a third edition became manifest, and it now presents itself as a volume of three hundred and thirty-four pages three and a half by six inches.

The subject-matter is divided into three parts. Part I. occupies eighty-two pages, and is devoted to the consideration of the various drugs alphabetically arranged, and under each drug is an alphabetical list of the diseases to which it is applicable, giving also the dose and authority for its use.

Part II. is the most pretentious, and occupies two hundred and sixteen pages. This section is devoted to the therapeutics of the different diseases of infancy and childhood. Speaking of the treatment of cholera infantum, the author lauds most highly the liquid extract of *coto*, and considers it almost as much of a specific in this condition as *ipécac* is in acute dysentery. Its value was first pointed out by Surgeon-Lieutenant-Colonel Ross, of Delhi.

Part III. contains a number of recipes for the proper preparation of various broths and wheys, and gives the methods for both sterilizing and pasteurizing milk, showing clearly the advantages of the latter over the former process.

The volume is a convenient hand-book, and represents the author's own experience, with cullings from the standard works on children's diseases, notably those of Ashby and Wright, Yeo, Starr, and Carmichael.

W. H. P.

BOOKS RECEIVED.

E. H. COLEGROVE & CO., CHICAGO.

BLOOD-SERUM THERAPY AND ANTITOXINS. By George E. Krieger, M.D., Surgeon to the Chicago Hospital, etc. With illustrations. Pp. 69. 1895.

WILLIAM WOOD & CO., NEW YORK.

RELATIONS OF DISEASES OF THE EYE TO GENERAL DISEASES. By Max Knies, Professor Extraordinary at the University of Freiburg. Forming a Supplementary Volume to every Manual and Text-Book of Practical Medicine and Ophthalmology. Edited by Henry D. Noyes, A.M., M.D., Professor of Ophthalmology and Otology in Bellevue Hospital Medical College, etc. Octavo, 470 pages, illustrated, extra muslin, price, \$4.25.

A MANUAL OF DISEASES OF THE EAR, FOR THE USE OF STUDENTS AND PRACTITIONERS OF MEDICINE. By Albert H. Buck, M.D., Clinical Professor of the Diseases of the Ear, College of Physicians and Surgeons, Columbia College, New York. Second revised edition. Pp. 457. 1895.

D. APPLETON & CO., NEW YORK.

DISEASES OF THE EAR: A TEXT-BOOK FOR PRACTITIONERS AND STUDENTS OF MEDICINE. By Edward Bradford Dench, Ph.B., M.D., Professor of Diseases of the Ear in the Bellevue Hospital Medical College; Aural Surgeon, New York Eye and Ear Infirmary. With 8 colored plates and 152 illustrations in the text. Pp. 645. 1894.

W. B. SAUNDERS, PHILADELPHIA.

SURGICAL PATHOLOGY AND THERAPEUTICS. By John Collins Warren, M.D., Professor of Surgery in Harvard University; Surgeon to the Massachusetts General Hospital. Illustrated.

ESSENTIALS OF DISEASES OF THE SKIN, INCLUDING THE SYPHILODERMATA. By Henry W. Stelwagon, M.D., Ph.D., Clinical Professor of Dermatology in the Jefferson Medical College, etc. Third Edition, Revised and Enlarged. With 71 letter-press cuts and 15 half-tone illustrations. Price, \$1.00 net. Pp. 27. 1894.

DOSE-BOOK AND MANUAL OF PRESCRIPTION-WRITING, WITH A LIST OF THE OFFICIAL DRUGS AND PREPARATIONS, AND ALSO MANY OF THE NEWER REMEDIES NOW FREQUENTLY USED, WITH DOSES. By E. Q. Thornton, M.D., Ph.G., Demonstrator of Therapeutics, Jefferson Medical College of Philadelphia. Pp. 334. Price, \$1.00 net. 1895.

SYLLABUS OF GYNÆCOLOGY, BASED ON THE AMERICAN TEXT-BOOK OF GYNÆCOLOGY. By J. W. Long, M.D., Professor of Gynæcology and Pediatrics in the Medical College of Virginia. Interleaved. Price, \$1.00 net. Pp. 133. 1895.

LABORATORY GUIDE FOR THE BACTERIOLOGIST. By Langdon Frothingham, M.D.V., Assistant in Bacteriology and Veterinary Science, Sheffield Scientific School, Yale University. Illustrated. Price, \$0.75, subject to the usual trade discount. Pp. 61. 1895.

NOTES ON THE NEWER REMEDIES, THEIR THERAPEUTIC APPLICATIONS AND MODES OF ADMINISTRATION. By David Cerna, M.D., Ph.D., Demonstrator of Physiology and Lecturer on the History of Medicine in the Medical Department of the University of Texas. Second edition, enlarged and revised. Pp. 253. Price, \$1.25. 1895.

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[No. 3.

ORIGINAL COMMUNICATIONS.

PRACTICAL OBSERVATIONS ON CERTAIN SYMPTOMS WHICH ACCOMPANY THE WASTING DISORDERS OF INFANTS (ATHREPSIA).

BY A. ERNEST SANSOM, M.D., F.R.C.P. (Lond.),

Physician to the London Hospital and Lecturer on Clinical Medicine at the London Hospital Medical College; Consulting Physician and Vice-President of the North-Eastern Hospital for Children (London), etc.

IN the case of a wasting infant it is very important that the perineum should be examined. Very commonly it may be seen to be covered with a red eruption. This is especially noticed upon the nates, the scrotum, the flexors of the thighs, and in female children the labia. When it first appears it has the character of a rosy blush, pressure with the finger causing the disappearance of the color. Soon afterwards it will present two characters, an outer zone which is of this red color, abolished by pressure, and a central portion showing a more persisting tint, and either moist with exudation or harsh to the finger from an exudation which has become dried. The exudation is the result of the rupture of a vast number of extremely minute vesicles. Sometimes these are visible as little elevations like miliaria, but often they have disappeared, their situation being covered with exudation when the examination is made. The eruption thus has the twofold character of *erythema* and *eczema*. It is an early sign of malnutrition very frequently associated with thrush. When thrush is observed in the mouth the red eruption about the nates is nearly always seen. The eruption, however, frequently occurs in the absence of thrush in the mouth. There can be little doubt that it is due to an irritation of the skin from a vitiated state of the excretions, an irritation propagated from the excretory orifices.

Thrush is an index of an imperfect nutrition associated with an acid state of the mouth. So a red eruption about the perineum is an indication that malassimilation is attended with a morbid state of the excretions, causing them to act as irritants to the skin. The eruption may be transitory. If the diet be conducted on rational principles, and if all causes of irritation of the parts be taken away, the skin may speedily become healthy. In the case of the infant we should inculcate the principles of rational diet, and be sure, if artificial feeding be practised, that the milk be sterilized and then alkalized by lime-water. The perineum should be well washed, not with soap, for any soap may irritate, but with warm water with which a handful of oatmeal has been mingled,—and afterwards dusted with finely-powdered fuller's earth, or, better still, lycopodium. The topical treatment is very important. Very frequently one finds that the parts are dusted with starch, known as violet powder. The starch granules, however, under the influence of the moisture which is so abundant about the parts, tend to cake together and form masses which themselves cause irritation. Cases have been recorded in which a powder supposed to be starch thus applied has caused death. Arsenic has actually been sold as violet powder, and has produced sloughing of the parts and death of the child. Bouchut has recorded a case in which corrosive sublimate was thus used in error, and the child died with salivation and the signs of mercurial poisoning.

The eczema and erythema may, however, not disappear, but take on worse characters. The old spots may extend their area and new ones may appear. The infant suffers, cries, and becomes agitated, and the movements of the affected parts cause friction, which deepens the intensity of the disorder. In many spots the superficial layers of the epidermis are destroyed and there are erosions which sometimes bleed, and sometimes give forth a copious exudation. The tissues about the parts affected may become œdematous. When these signs are evidenced there is a more profound depression of the powers of digestion and assimilation. Wasting under such circumstances usually takes place rapidly. Malnutrition is competent to produce all these phenomena, the diarrhœa so frequently present acting as an additional provoking cause, but it is very important to determine whether behind them there is the special dyscrasia induced by congenital syphilis. In the latter case, although the commencement of the affection may be with the rosy-red erythema, the patches are generally less red and more of the color of pale-brown paper, or in some cases of a deeper copper tint. There are usually also other manifestations upon the skin in cases of syphilis,—papules, mucous plaques about the anus or about the mouth, and eruptions over the face, trunk, and limbs, etc. When the eruption about the perineum is severe or chronic it is important to determine whether the case is syphilitic, because, in addition to the general treatment of the condition of wasting and the local treatment of the affected parts, there must be the special treatment of the syphilitic taint. In the severe cases additions may be made to the simple local treatment which I have mentioned. When

there is much abrasion I have found the carbolized lycopodium, the formula of which I first promulgated in 1871, of great value,—

Take of

Pure carbolic acid, gr. x ;

Rectified spirit, ℥xxx ;

Lycopodium powder, ℥i.

Mix well together.

The carbolic acid¹ and spirit should be first mixed in a mortar, and then the lycopodium gradually added, the whole being afterwards well mingled upon a flat surface. A powder of subnitrate of bismuth or of oxide of zinc may be used as a local application.

In addition to the powder, vaseline or oxide of zinc ointment may be used with advantage. By this all the parts to which the powder does not adhere are protected from the irritant excretions.

Leaving the cutaneous phenomena which attend the wasting disorders of infants, I will now consider symptoms especially referred to the *abdomen*.

First, *flatulence*. Very few infants escape from manifesting some symptoms of this disorder. The legs are drawn upward, the face becomes distorted and the brow wrinkled, and the cry is one that indicates pain. Very often during sleep a little convulsion of the facial muscles is seen to take place ; this sometimes causes an appearance as of a smile passing over the countenance ; old nurses know how to correct the impression of the inexperienced that the child is in a happy state of content ; they say that the apparent smile is the effect of “the wind.” This is often confirmed by eructations or discharges of flatus taking place, and the infant becomes temporarily relieved. Such often occurs in an infant at the breast, before it has become habituated to the new order of things which obtains after its birth ; and when it is suckled regularly the symptoms pass away. Much more frequently and more severely it occurs in artificially fed children. The frequently recurring pains associated with this flatulence make the child extremely irritable. The condition of flatulence is manifested also in an habitually distended abdomen. It is to be remembered that even in a healthy child the abdomen is proportionately large. Dr. West has pointed out that this fact was recognized by the old masters of painting. The child-angels of Rubens present highly-developed abdomens. One cause of this is that in early life the liver is much greater in bulk proportionately to the body than in adult life. Another is that the alimentary canal of the infant must be supplied—necessarily for its rapid growth—with a greater proportionate amount of food than is required for the maintenance of the equilibrium of the mature body. The chest and pelvis of the infant are small as compared with the prominent abdomen. In the case of the wasting infant, however, the preponderance is much more marked. The percussion over the areas occupied by the stomach and intestines elicits a tympanitic

¹ Thymol or eucalyptol may be used instead of the phenol.

sound. The abdomen is tense, and the superficial veins, from their compression, are strongly defined. The alimentary canal is distended with flatus.

I am convinced that there is much misconception as to the nature of such flatulence. According to a very common explanation, it is due to the evolution of gas from the decomposition of food. A little reflection would show that the degree of fermentative or putrefactive change which the food could undergo in the alimentary canal would be quite insufficient to generate the notable amount of gas which distends the abdomen. A much more feasible explanation offers itself. Atmospheric air is constantly entering with food, liquid, and solid; while the muscular coat of the stomach and intestines is fairly strong, these cavities are properly adapted to their contents. When, however, a cause exists to enfeeble the muscles, the air accumulates. This accumulation need not be in all parts. Some may be in a condition of distention, others in one of contraction, others in spasm. So we have the irregular and variable conditions of pain, or the stable condition of distention without pain. No doubt some volatile products of decomposition mix with the air thus retained.

The immediate treatment of flatulence is generally pretty well understood by nurses. They give the infant a teaspoonful of dill-water at intervals, or, if that is not at hand, they boil a few caraway-seeds in water, in a tablespoon over a hand-lamp, and administer a teaspoonful of the clear decoction occasionally. These aromatics stimulate the muscle of the stomach and bowel to expel the flatus. One of the most efficient agents to relieve the flatulent colic of infants is the spirit of nitrous ether. Ten drops of this in a teaspoonful of water give great relief. The most useful combination, however, that I have used is the following, which has obtained such good repute that my patients have termed it "good-temper medicine:"

Take of

Powdered rhubarb, 2 grains;
Bicarbonate of soda, 2 grains;
Fœtid spirit of ammonia,
Spirit of nitrous ether, of each 3 minims;
Dill-water, 1 fluid drachm.

Dose, one drachm three times a day.

In some cases oil of turpentine in two-minim doses, with half a drachm of castor oil emulsified with acacia mucilage, has been used. In all the instances in which flatulence is a feature, it must be remembered that this is but a symptom of impaired digestion; palliative treatment, therefore, though useful, should be regarded only as an adjunct to the efforts which should be made to establish a well-regulated dietary.

Another abdominal complication often accompanying flatulence, and attending on the early stage of the wasting disorder of infants, is *constipation*. It is not merely that the action of the bowels takes place too infrequently,—once a day, perhaps, or once in two days,—but the efforts at

expulsion are attended with signs of pain and distress. The infant's face becomes congested, it cries violently, and struggles. When we hear of such symptoms, insist on examining the rectum. Often we find the mucous membrane of the orifice congested, perhaps fissured or abraded, and even bleeding; tumultuous and irregular action of the muscles may alternately draw it inward and protrude it. We may see a hard, whitish mass of *fæces* presenting. In such case the nurses often cut a thin parallelogram of soap, and having oiled it push it into the rectum. So the expulsion of the mass is facilitated. It is better, with a small hollow india-rubber ball, to throw up half an ounce of olive oil. By such means we may at once restore the screaming infant to peace and happiness; it may be a case in which the cause of the screaming was imperfectly understood. It is a good rule, therefore, always to examine the rectum of a suffering infant. Of course this treatment is only directed to the *immediate* relief, though directions may be given for its repetition as occasion requires; but we have to consider other indications. Constipation means imperfect peristalsis, feebleness of the muscle of the intestines, whereby the contents of the bowel are retained an undue length of time; coincidently there is a deficiency of the secretion of the mucous glands of the intestines; the *fæces* are in compact masses, hard and dry. Constipation, then, is a twofold difficulty in an infant; it is a mechanical source of disturbance, and an indication of dyspepsia. In the treatment of it, in addition to the measures of local relief, dietetic and hygienic means are of the greatest, and medicinal means of the least, importance generally. If the child be at the breast, regulation and modification of the mother's dietary may suffice to restore the natural regularity to the infant. We should see that the clothing is sufficient, and that the limbs are not cold; a warm bath often relieves the suffering of a constipated child, and is followed by an evacuation. Let an extra pad of warm flannel be worn over the abdomen. In many cases, rubbing warm olive oil into the surface of the abdomen night and morning is very valuable. It is not generally known that an aperient effect may be directly induced by castor oil topically applied. Let a piece of cotton wool be saturated with a tablespoonful of castor oil; apply this to the surface and cover with a thin linseed poultice. This rarely fails to produce an aperient effect. In the case of an infant that has begun to take farinaceous food, fine oatmeal or lentil flour may be an ingredient of the daily dietary. In a large majority of cases medicine administered by the mouth is unnecessary. If dietetic means fail, the simplest medicinal agents should be used. One of the best of such medicines is, in my opinion, half a drachm to a drachm of pure olive oil, administered once or twice daily. Castor oil and rhubarb, though efficient aperients, should generally be avoided, because they tend to induce constipation after their first action.

Now let us suppose that the infant manifests *diarrhœa*,—a more frequent and a more dangerous symptom than constipation. In a large majority of cases *diarrhœa* is an early concomitant of wasting, and, if it does not per-

sist throughout, it crops up occasionally in the course of the disorder. The actions of the bowels are observed to be irregular and too frequent; the dejecta, instead of being of the color of the yolk of an egg and of equal consistence, are watery, interspersed with whitish, grayish, or greenish fragments, and have a sour smell. They are, moreover, irritant to the skin, and tend to produce the erythema and excoriation which we have considered. They are sometimes of gray color or almost white, sometimes pale yellow, acquiring soon after having been passed a green tint,—the variable coloration being due to oxidation of the biliary excretion. In some of the cases of very young infants, addition of a watery solution of iodine to the voided matter will show, by the blue coloration which it gives, that granules of undigested starch are present. These will be found surrounded by, and embedded in, abundant mucus. This observation often serves to prove to demonstration a faulty alimentation. As the diarrrhœa goes on the stools sometimes acquire a deep-green color; they resemble chopped spinach, or they may become more and more watery, with flocculi of undigested curd, and dirty-gray mucus here and there. Then a very repulsive odor characterizes the evacuations, an odor suggesting putridity. Sometimes such diarrrhœa occurs as a passive flux without pain, at other times signs of pain are great, and the fecal matters, often accompanied by flatus, are expelled suddenly and with violence.

The thermometer shows that during the continuance of the diarrrhœa which is due to wasting disorder there is no fever, the temperature is depressed, not elevated, and the observation is most important for differential diagnosis. Diarrhœa occurring in this form in earliest infancy is not a disease, but a symptom of dyspepsia. Unfortunately, however, it often becomes the dominant symptom, and by draining away the fluid parts of the blood it not unfrequently is the determining cause of death. When an infant suffers from diarrrhœa within the first year of life, there is a strong probability of some error in the dietary. Attempts to arrest the diarrrhœa are of far less importance than the removal of the cause on which the diarrrhœa depends. This cause is commonly an imperfect or improper alimentation; the treatment, therefore, is for the most part that for the general cause of the existing disorder.

When diarrrhœa is a prominent symptom, or when it persists, wasting takes place with great rapidity. The superficial fat disappears; the muscles become soft and flaccid; the face is pinched and wrinkled, and dark circles are seen around the eyes; the scalp over the fontanelle is sunken. In a large number of cases the abdomen is large and prominent, contrasting strongly with the diminished proportions of the rest of the body. Percussion over it elicits a tympanitic sound; the distention is due to flatus. In many instances we are asked by the parents whether the infant has “consumptive bowels” or “consumption of the bowels.” The popular mind associates the disorder with tubercular disease,—incurable, and of the nature of pulmonary consumption,—but we should not be too ready to acquiesce in the

popular notion and believe that in these cases there is actual tubercular change in progress. Tubercle within the abdomen is rare in infants; it is very seldom met with under the age of three years. In the differential diagnosis an importance attaches to the indications which the thermometer affords. While in progressive wasting disorder the temperature is depressed, when tuberculization is in progress there are intervals in which temperature is markedly elevated. The ordinary wasting disorder of infants is not tubercular; this can be proved by two classes of evidence,—the one showing that even when an infant has become so attenuated that, to a casual observer, recovery seems to be impossible, satisfactory nutrition may be gradually restored and a recovery be made, the other, that in the fatal cases, tubercular changes are not observed in the post-mortem examinations.

When wasting and exhaustion have proceeded far, certain central phenomena must be looked for. In the earlier stages the child is very irritable; it cries frequently, and takes ravenously the food that is administered to it, and, though satisfied for a little while, soon cries again, with evidence of pain. In the later stages, however, there may be an unexpected quietness; the infant lies listless and lethargic. This is by no means a favorable sign. If we raise the upper eyelid and examine the pupil we find it motionless and probably contracted. The condition is one of coma.

In other cases *convulsions* may be observed. In quite an early stage, and, indeed, when there is little or no deviation from health, attention may be called to what the nurses call “inward fits.” These are sometimes only slight wavy movements of the muscles on one side of the face, giving the infant the aspect of smiling, and are the reflex effect of a slight and unimportant stimulus, as when the infant “has the wind.” In other cases there may be a rolling of the globes of the eyes with, perhaps, very slight disturbance of the muscles of the face, and curving inward, towards the palm, of the thumbs and fingers, or a flexing of the toes. These are signs of epileptiform convulsion which are very important to note, but are not in any necessary way connected with wasting disorder. The form of convulsion which occurs in the latter is characterized by immobility, profound insensibility, and dilatation of the pupil. Coincidentally, respiration is so far arrested that no movement of the thorax is seen, and the surface of the body presents a bluish or leaden color. Though convulsions may occur at intervals, until a short time before death, they generally cease some hours, at least, before the end comes, death being by way of coma.

The following are the *post-mortem signs* usually observed in cases of progressive wasting of infants: The subcutaneous fat, and, indeed, the fat of the whole body, has almost entirely disappeared; the walls of the stomach and intestines are very pale and thin, and in some cases a portion of the stomach may have undergone post-mortem softening. The gall-bladder is distended with bile. The liver is congested, the deep color, due to its being soaked with venous blood, contrasting with the pale hue of the other viscera. So far the appearances are precisely those which are observed in

cases of starvation. In addition to these signs the pale mucous membrane of the small intestines may be seen in some cases to present patches here and there of a greater vascularity. The lymphatic glands, in connection with the intestines, are notably enlarged; Peyer's glands in the small, and the solitary glands in the large, intestine. Frequently, also, the mesenteric glands are enlarged. The signs are, in fact, those of (1) starvation, (2) anæmia, (3) irritation and inflammation of the glands embedded in the mucous membrane of the intestines, (4) enlargement of these and the mesenteric glands consequent upon the protracted disturbance to which the lymphatic tissue is subjected.

TREATMENT OF TUBERCULOUS AFFECTIONS OF THE KNEE-JOINT.

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THE matter of the treatment of synovial tuberculosis, or tubercular disease of the knee-joint, has seemed one of such general interest that I have endeavored to avoid discussing all fine matters of differentiation in the character of the disease, and give the principal points in relation to treatment.

The successful treatment of tuberculous disease of the knee-joint is one which depends on a large variety of issues, but most particularly on a thorough knowledge of the pathology of the initiation and inception stages of the disease, on the part of the surgeon. The knowledge of the pathological significance of perverted conditions existing in the region of the knee-joint, or in its auxiliary and attached tissues, is as essential to the functions of any one presuming to deal with surgical cases as is a knowledge of the physiological action of opium to the medical practitioner. It may even be said that a thorough knowledge of the significance of these symptoms is of more importance, for the responsibilities attending the acceptance of the care of a case of this kind are among the greatest which we are called upon to assume.

It is always to be remembered that just in proportion as the diagnosis is made early in the course of the disease, just so much greater are the chances for cure; and the surgeon is never to lose sight of the fact that his responsibility for bad results increases in proportion with the time which elapses between the time when he first sees the case, and the time when, assuring himself of the correctness of his diagnosis, he begins treatment in accordance with the pathological conditions existing, and those which his

experience and his knowledge of the experience of others assure him must necessarily follow.

While the tuberculous condition of the tissues in and about the knee-joint depends for the possibility of its existence on a depraved general physical condition, and a state of diminished resistance, each and every one of the symptoms of the disease referable to the knee-joint or its neighborhood has a special and discoverable cause and possible remedial antagonist. It is ever to be borne in mind what these special causes are, and to so antagonize them as to be able in so far as possible—the personal idiosyncrasy of the patient being considered—to remove them, and thus to obtain the best and surest favorable results.

It is a postulate which must be admitted as beyond the possibility of successful refutation that tuberculous disease of the joints is a condition caused by the presence in the joints, or in the periarticular tissues, of the bacillus tuberculosis or its products.

Granting this to be the case, the condition is one in which we have to deal with a disease—essentially caused by the presence of a foreign substance—which is capable of following one of two courses,—either caseous degeneration, encystment, and cicatrization; or progressive and continuous development, with consequent degeneration and destruction of its environment. It must then be evident that all efforts at treatment of the disease must be either in the direction of encouraging encystment and cicatrization, or at removal of the cause, and encouraging repair in the tissues thus freed of the exciting element of their original retrograde metamorphosis.

A diagnosis having been made, it devolves upon the surgeon to decide which of these two courses is to be followed; whether a just consideration of all the factors in the patient's general and local condition, and a desire to prevent mutilation, will warrant the hope of a cicatrization of the tuberculous foci, or whether the symptoms are of sufficient gravity to make it necessary that immediate surgical interference, for the removal of the diseased tissues and their causative element, even at the certain risk of loss of function of the diseased limb and definitive ankylosis, should be undertaken.

If the first of these two alternatives is to be followed, it is to be borne in mind that, should caseation and encystment take place, there is still left behind in the tissues of the patient a nidus, from which at any time there may be a general infection, and which is a continual menace of metastasis of tuberculous infective material to any part of the body or to any organ.

It is also to be remembered that about the joint there are only "two tissues in which the tuberculous germs can find lodgement and a suitable soil for growth,—namely, the synovial membrane, and the cancellous tissue of the bone," and that tuberculous disease of the joints is almost invariably a result of secondary deposit, or of metastasis of tuberculous infection from some other part of the body. This fact, which is well borne out in experience, has a very important bearing on the question of prognosis, and

should be constantly borne in mind in deciding as to which course to follow in relation to the treatment.

Inasmuch as experience has shown that the process of tuberculous inflammation of the knee-joint has its origin in the epiphyses in young subjects, and in either the condyles of the femur or the head of the tibia in older persons, it must be evident that if encystment and cicatrization are to be hoped for at all, it must be at or during the time before perforation of the joint by tuberculous products has taken place.

The question of treatment, then, naturally divides itself into two periods,—I., before joint-disintegration begins; II., after perforation of the synovium and partial destruction of the joint structures. (Since the treatment of tuberculous arthromeningitis originating in the synovium itself is the same as that of this later period, it will be considered under that head.)

I.—BEFORE JOINT-DISINTEGRATION COMMENCES.

1. *General*.—Fresh air, nutrition, hygienic improvement, removal from original environment, attention to digestion, use of creosote and cod-liver oil, phosphorus, sunshine, fresh air, exercise.

2. *Local*.—Local rest, immobilization of joint, counter-irritation, cyanosis, pressure, inunctions, incision of bone and removal of tuberculous foci, bandaging, elevation and position, splints.

II.—AFTER JOINT-DISINTEGRATION HAS BEGUN.

1. *General*.—Prevention of general infection, septicæmia, pyæmia, etc., as above.

2. *Local*.—Rest, immobilization, drainage, removal of causative nucleus in bone, evacuation of pus and injections of iodoform, iodine, etc., arthrotomy, arthrectomy, excision, ankylosis, massage, forcible and gradual motion.

GENERAL HEALTH.

In no disease with which we have to contend is the matter of attention to the general health of the patient of greater importance.

It is essential that the nutrition be brought to the highest state of perfection possible, by attention to the hygienic surroundings, the food, the respired air, the amount of sunshine that it is possible for the patient to enjoy, the establishment of proper excretion through the skin, the maintenance of perfect action of all the emunctories, and especially by the removal of the patient from the environment in which the disease has been acquired. All these matters are worthy of the minutest attention of the surgeon, and each and all of them are essential to the production of the desired result.

DIATHESIS.

It is to be remembered that the class of patients suffering from tuberculous disease is that of the so-called strumous diathesis, and under any circumstances these patients have a diminished resistance to the growth of

the germs, and in them the function of resistance to the action of the products of germ-growth is in a greater or less degree modified.

REST.

Rest is *par excellence* the prime factor in treatment; not alone general bodily and mental rest, but local rest as far as the joint is concerned. It must not be forgotten, however, that any scheme of rest which does not provide for a sufficient amount of exercise to maintain the bodily functions at a high plane of perfection is a mistake as fatal as it is short-sighted. It is recommended by many authors that patients suffering from joint-disease be at once put to bed, and kept there until the disease is cured.

I must protest that such a policy is not in accord with what we know about the importance of general hygiene in the care of the surgically sick, and that the patient who has been put to bed with tuberculous joint-disease is in great danger of deriving far more harm from such imprisonment than from a more far-seeing policy of permitting a certain amount of *general exercise* while local rest is being maintained. If from feebleness, or any other reason, it is impossible to so adjust the limb in an immovable dressing as to allow the patient to get about, provision should be made for sunbaths, and as great a degree of exposure to fresh air and pleasant surroundings as may be compatible with the circumstances. The necessity for rest to the joint was recognized by the older surgeons, although they had but small idea as to the pathology of the condition, and had no idea as to the presence of the tubercular germ. Thus Holmes in his treatise on "Surgery," in referring to "pulpy synovitis," says that "the strictest local rest should be at the same time enforced. If the joint is too irritable to bear a splint it should be supported on all sides by some soft substance." Spasm is one of the most distressing of the symptoms which accompany the disease, and there is no means within the range of our surgical knowledge which will enable us to overcome these painful muscular contractions, unless it be the use of opium to the point of complete narcosis, except procurement of absolute rest by means of apparatus of different kinds, which shall be so adjusted as to separate the ends of the bones from each other, and for the time, at any rate, overcome the normal tendency to contraction, which has been exaggerated by the presence of the disease in the head of the bone or in the synovial sac.

Generally speaking, however, during the first period of the disease, when it is desired to secure rest for the purpose of bringing about encystment, it is perhaps best to put the patient to bed and apply the weight and pulley.

Marsh, in his treatise on "Diseases of the Joint," says, "Any scheme for treating joint-disease must include a provision for the relief of interarticular pressure. The joint may be placed in some form of rigid apparatus (plaster) which prevents movement, and under the influence of which muscular spasms will subside." Unfortunately, however, this method of treatment,

while perfectly applicable to other joints, is not to be recommended in treatment of the knee or hip.

Inasmuch as the reflex spasms and contractions of the muscles in disease of the knee-joint produce a partial flexion of the limb, it is necessary first to straighten the limb. This should be done under an anæsthetic, and then pulley-and-weight extension applied for a time, or until there is some marked evidence that the measure is of value, or that the disease is progressing so rapidly as to preclude the hope that this method of treatment will be of value.

The idea of rest implied in the foregoing statements signifies not alone immobilization of the limb, but also an effort to overcome the reflex contractions of the muscles, and by means of extension of the limb, the thigh being fixed, to separate the sensitive cartilages and the inflamed surfaces of the synovial membrane. That this may be done in those cases in which it is impossible for the patient to leave his bed, it is necessary that an apparatus should be arranged so that the thigh may lie at an angle of about one hundred and twenty degrees to the body, and the leg below the knee be horizontal or parallel to the surface of the bed. This may be done by means of hard pillows, or by means of splints arranged in the form of a box with a bevelled end, the apex angle of which is to be placed under the tuber ischii; extension then may be applied with straps about the leg and a weight-and-pulley arrangement at the foot of the bed.

It is to be remembered that in many instances it is impossible to bring about satisfactory extension and separation of the cartilages of the knee-joint, with the leg in a position of complete extension; because the muscles about the hip-joint, the psoas, and iliacus are thus put on a stretch, and a leverage is thus brought upon the femur in its relation to the pelvis, which leverage being extended through the biceps and triceps muscles, vastus internus and externus, and the flexors of the leg upon the thigh, tends to produce a leverage-like action in the relations existing between the tibia and the femur, with the knee as a fulcrum point, and often this leverage-like action entirely defeats the effort at extension, inasmuch as the ends of the tibia and the femur are brought in more close apposition, and the point of increased friction and erosion is formed in a new place on the ends of the bones. But if it is a possible thing for the patient to be allowed to go about, it is far better to put on a Thomas splint, and with a shoe on the other foot, made with a sufficiently thick sole and high heel, so that the splint is brought off of the ground, the patient may be permitted to take advantage of the fresh air, exercise, and sunshine.

It is always to be remembered that rest must not, when the conditions can by any possible means be made favorable, include the idea of seclusion and remaining in-doors, for of all the diseases with which the surgeon has to deal none calls for more complete and abundant supply of sunshine, fresh air, and proper hygienic surroundings than does the tuberculous disease of the joints. It should therefore be the effort of the surgeon, in all cases

where it is possible, so to arrange splints and immobilization apparatus as to permit this freedom of exercise.

CYANOSIS.

In the *Centralblatt für Chirurgie* for 1892, Beier, of Kiel, gives some interesting statements as to the use of a method of treatment of tuberculosis of the joints, which is, to say the least, worthy of further trial and investigation.

It depends for its remedial principle on the dictum first enunciated by Rokitansky, and afterwards supported by Niemeyer and Laennec, that cyanosis was inimical to tuberculosis, and consists in the production of localized cyanosis by the use of the elastic constricting bands of Esmarch.

The circulation of the limb is supported by means of an evenly-applied bandage on the distal side of the affected joint, and the elastic constriction is applied either continuously or for ten or twelve hours daily to the limb, on the proximal side. The results claimed by Beier are, to say the least, astonishing, and in the hands of Page, of London, have apparently been sufficiently favorable to warrant further continuance of the treatment. For a further and more detailed relation of the method and its results, I must refer you to the reports of Mr. A. G. Miller in the *Edinburgh Medical and Surgical Journal* for February, 1894.

INTERNAL MEDICATION.

As to the employment of internal remedies with the object of producing connective-tissue proliferation, or with the intention of bringing about absorption of the products of inflammation, our knowledge of the pathology of the disease at this time must lead us to be somewhat sceptical as to the possibility of realizing any results from such means.

Cod-liver oil, iron, hypophosphites, creosote, guaiacol, and other remedies which have been recommended in the treatment of tuberculosis of other parts of the body, are in the treatment of the condition under discussion of use only in so far as they tend to improve the general constitutional state of the patient, and we may hope nothing from them when given by the stomach, as far as any modification of the local condition is concerned.

ENUCLEATION.

As to the matter of treatment of the deposit of tuberculous material within the femoral epiphysis, or in the head of the tibia, with the object of its enucleation before its destructive tendencies shall have impaired the intracapsular structures, one may well hesitate before so radical a course. Yet when the full significance of the symptoms is appreciated, and the infectious character of the encapsulated material is understood, there should be no hesitancy on the part of the surgeon.

Should a hectic temperature curve, or local pain, with continued emaciation, accompanied by other symptoms of intra-osseous abscess and osteitis,

develop, there can be no question of the advisability of early incision and enucleation of the tuberculous focus.

In doing this, however, it is necessary to remember that it is not alone desirable to give escape to the contents of the bone abscess, but to remove with the curette all the halo of diseased and infected tissue about its periphery, and should it have chanced that subperiosteal or subcutaneous sinuses exist, they should be laid open or excised, and provision made for their free drainage and disinfection, after which the limb should be placed in a condition of immobility, and the effort made to give it perfect rest until healing shall be complete.

The value of instillation of balsam of Peru and other balsamics in diseases of the bones was recognized so long ago as the time of Helvetius and the other masters of surgery of the middle of the seventeenth century; but we particularly owe it to Sayre, Post, and Landerer that the use of this remedy has been revived during our time. In the hands of these men and many others it has proved of marked value in the treatment of cavities in the bones after enucleation of tuberculous foci, and as a means of increasing tissue-proliferation and healthy granulations to fill up the spaces left after operative interference.

Simple incision of bone abscesses, followed by injection of a five-percent. glycerin emulsion of iodoform, has been a successful measure in the hands of some surgeons, and is worthy of continued experimentation.

Even before there shall have been any definite evidence of rapid degenerative change in the tuberculous foci, a clear diagnosis having been made, an early incision and complete enucleation is to be recommended, and the bone cavity encouraged to closure by the implantation of the bone chips of Senn.

In the slower forms of the disease, which tend to spontaneous caseation and cicatrization, good results may be looked for from the course above indicated, but in the more acutely violent forms, especially in that form of the disease in which there is manifest tendency to liquefaction and granular degeneration, so rapid is the progress of the infection into the tissues about the original focus that but little can be looked for in the way of prevention of joint and wider osseous destruction from the measure.

In dealing with sequestra in the bones, it is to be remembered that they are usually wedge-shaped, with the apex pointing in the direction of the medullary cavity and the base towards the articulation, and that, further, between these wedge-shaped sequestra and the healthy osseous substance there is usually a layer of granulation tissue filled with tuberculous infectious material, and also that the sequestrum may be attached to the healthy bone by apparently healthy tissue. In order that the operation for enucleation shall be of value, it is necessary that all these parts shall be entirely and absolutely removed, and that all tissue in the bone to which any shadow of suspicion may be attached shall share in the general removal.

Poore says, "If pain increases and symptoms of abscess in the bone

show themselves, there is no better or safer plan than to cut down upon the tender point, apply a trephine, and clear out the abscess cavity. We may even go further, and say, if a child has received an injury to the articular end of the bones, and if after rest for weeks there still continues a tender point over the bone, it is good practice and safe to trephine over this point, and allow drainage from the bone."

GENERAL INFECTION, PYÆMIA, SEPTICÆMIA, ETC.

After perforation of the joint has taken place, it is necessary to guard against the occurrence of general infection from the tuberculous germ and its products. The extreme susceptibility of the synovial membrane, while it yet remains in a measure intact after its perforation, to the absorption and reception of infectious products makes this stage of the disease a most dangerous one for the patient, and usually the symptoms which supervene upon the perforation of the joint capsule, or the synovial membrane, are those which are recognized as being indicative of a general sepsis. After *pus* has been formed in the joint, and after there is a degeneration of the synovial membrane itself, the patient, already in a condition of health deterioration, is extremely subject to a general septicæmia and pyæmia, and to the occurrence of metastatic foci in various parts of the body; and especially in the lungs and peritoneum, and these facts should always be borne in mind. Therefore quinine, the hypophosphites, iron, cod-liver oil, creosote, and the other reconstructive remedies are indicated at this stage of the disease. And more particularly at this time than at any other should the digestive process be looked after, and the whole condition of the economy rendered as perfect as possible as far as the matter of absorption and nutrition is concerned.

The next question which will arise is as to whether it is justifiable to lay open the joint and procure proper drainage from its cavity. It was an old idea that an abscess forming about a tuberculous joint was not one which called for immediate interference; that through some local process the discharge of the *pus* relieved, in a measure, the disease in the joint. This idea may have been derived from the fact that the pain which had previously existed in the head of the bone seemed to be relieved so soon as the intra-osseous pressure was diminished by the opening of the depot into the joint cavity. But it may be put as a surgical axiom that *pus*, or tuberculous products, wherever they occur in the body, must come out. Whether it be in the knee-joint, in a bone, or in the softer tissues, this rule should be held to as strictly in tuberculous disease of the knee-joint as in any other condition. Therefore, so soon as the symptoms shall be sufficiently pronounced to make a diagnosis of the intercapsular degeneration absolute, measures should be at once taken for drainage, and cleaning of the diseased cavity. It will be found in many cases that joint-destruction is so rapid, and takes place with such extreme activity, that no effort in the way of drainage or of washing out will be of any avail. The question will then

arise as to when it shall be time to perform some operation for the complete evacuation of the joint, not alone of its contents, but of all tissue which has become infected, with the idea of procuring ankylosis and complete stiffness of the limb.

Tuberculous joints have been injected with the idea of destroying the bacilli and their products, and so to modify their environment by the artificial increase of protective proliferating connective and fibrous tissue as to effectually wall off these causative agents from the surrounding tissues, and prevent metastasis, and thus preserve, at least in a measure, the function of the limb. For this purpose have been used the glycerin and ethereal emulsion of iodoform, salicylated solutions like Thiersch's fluid, solutions of corrosive sublimate in low potentiality, cinnamic acid, and iodine solutions.

Of course, in these days of antiseptics we are to turn our attention to the use of remedies with the end of conservation of the joints in all cases in which there is a reasonable hope of success. Iodoform emulsion injection after aspiration, and even after washing out the joint with a weak sublimate solution, has been of great value in the hands of many surgeons, in a limited number of cases, in which the diagnosis has been made early after the joint deterioration has begun, in those cases of tuberculous disease of the joint beginning in the synovial membrane itself. But little can be hoped for from it in those cases beginning in the epiphysis, without resort to operative interference for the purpose of cleansing the joint cavity, and the bone cavity, of its infective nucleus.

The so-called "cold" or "strumous abscess," the "senkungs abscess" of the Germans, being an evidence of tendon tuberculosis, having for its probable source some deposit in the cancellous tissue of one of the bones, a complication quite often accompanying tubercular disease of the knee-joint, calls for immediate evacuation and curettement and disinfection, and all sinuses should not only be curetted with the sharp spoon of Volkmann, but also, whenever it is possible, dissected out completely, with sufficient of the surrounding tissue to give assurance of complete removal of all neighboring infected tissue. No matter how thoroughly this may be done, it will often be found that dormant deposits will remain, which will be prone to take on retrograde tendencies, and form new abscesses and sinuses months and years after the subsidence of the original symptoms.

The utmost care is to be exercised in the after-treatment of these tuberculous abscesses, in order that there may be no infection of the abscess cavity, its sinuses, or original site of the tuberculous focus, with pus microbes, and thus a condition of general septicæmia be produced. It was this tendency to the occurrence of general sepsis which caused the older surgeons to conclude that it was better to avoid operative interference with the cold abscess.

It is a very difficult thing so to guard the wound and the unknown extent of absorbing abscess, bone, and pus-cavity that, in the course of the

weeks and perhaps months which must elapse before the healing is complete, there shall be no occurrence of sepsis from pus microbes. Nevertheless, such results may be accomplished in the hands of thoroughly aseptic operators and assistants, and with intelligent after-treatment.

A not infrequent complication of these tuberculous abscesses is the acute inflammatory abscess, with rapid destruction of all the tissues, the result of mixture of the infections of the streptococcus and the staphylococcus in the tissues of an individual whose powers of resistance are already reduced to a point far below the normal with the tuberculous infection; the principle of treatment in these cases being that general surgical one, so clearly enunciated by Chassaignac,¹ of evacuation, disinfection, and drainage.

When, however, it has been shown that all other lines of treatment are failures, or when there is such great destruction of the joint as to extinguish all hope of saving its functions in any degree, there remains for the surgeon but one alternative, and that is to bring about a complete ankylosis by one or another of the three methods, arthrectomy, arthrotomy, or complete excision; and in case of failure of any of these methods, to resort to amputation at a point sufficiently high up to include all infected bone and soft tissues in the amputated portion.

(To be concluded in the next issue.)

THE CLINICAL EXAMINATION OF THE BLOOD.

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OF all the essential parts of the human body, none is so subject to constant change as the blood. The daily absorption of food products, the various functional activities of regeneration and waste, all find their expression here and result in a continual alteration of its constituent parts. In addition to the more simple chemical changes in the plasma, the cellular elements are very varying in their individual characters not only, but they increase and decrease in number, both actually and relatively, almost from hour to hour.

Beyond the limits of these physiological fluctuations, the blood is very seriously and more or less permanently impaired as the result of most acute and chronic diseases, local as well as general, and especially those of a toxic nature from infections by micro-organisms and poisons. Again, besides these alterations of a secondary character, the blood undergoes grave changes in a variety of diseases, the essential nature of which is this very change in

¹ *Traité Pratique de la Suppuration et du Drainage Chirurgical*, vol. ii. p. 304.

itself, dependent, probably, upon derangement or impairment of the sources of blood-cell formation. Until recent years the points of differential diagnosis between these several conditions have not been clearly marked, and we have depended upon the gross clinical symptoms, supplemented by a more or less general knowledge of the varying proportion of red and white cells, to guide us. Only since the introduction of aniline dyes and the methods of preparation suggested mainly by Ehrlich have the lines been closely drawn and the changes in number and relative proportion of the cellular elements—and particularly the great variety and modification of the white cells—been accurately noted in conditions of health and disease. As a result of these methods our knowledge, both of the physiology and pathology of the blood, has been rewritten, and we are commencing to appreciate the wonderful complexity of this fluid on which our life depends.

In the very brief space allotted to this paper it is impossible to properly treat this large subject, and my present purpose will be gained if I succeed in outlining a few of the methods by which we are enabled to accurately appreciate the variations mentioned, and to show that most of them are so simple as to be within the reach of every general practitioner who has a slight working knowledge of the microscope. Before passing on to the detail of the technique, permit me to insist upon the great importance of a most careful study of the normal blood. The cellular elements are so very diverse and variable, not only in different individuals within the limits of health, but in the same person at different times, that it is only by a thorough knowledge of the conditions liable to be met with that we may hope to avoid error from the numerous misleading pictures presented to us, and to recognize the nature and extent of the pathological changes.

In the clinical examination of the blood, it is important to note the *number, form, and color* of the cellular elements, their character and relative proportion. The first essential is a count of the blood-cells, not alone to determine the number of red and white cells in a known portion of blood, but, of even greater importance, to ascertain the number of each of the several kinds of white cells. For the purpose of counting the red and white cells, the instrument of Thoma is the simplest and best, the blood being diluted with Toison's¹ solution, which stains and distinguishes the white cells. The count of the individual white cells is done after staining the preparation, as will hereafter be described. The determination of the hæmoglobin is very desirable, though of less importance, and for this the hæmometers of von Fleischl, Gower, and Henocque are to be recommended. Of these, von Fleischl's is the most reliable. After becoming familiar

¹ Toison's solution :

Distilled water, 160 c.c. ;
Glycerin, 30 c.c. ;
Sodium sulphate, 8 grammes ;
Sodium chloride, 1 gramme ;
Methyl-violet, 0.025 gramme.

with blood examinations, one may form a fair estimate of hæmoglobin by observing the fresh blood under the microscope. To ascertain the character of the individual blood-cells, we have recourse to the microscope, and for this purpose we need its higher powers. A moderate eye-piece and a one-twelfth oil immersion lens of good make suffices for all purposes. A very good estimate may be made of the character of the cellular elements by examining, under the microscope, the fresh blood between the ordinary slide and cover slip in such a thin film that each cell stands out separate and distinct from its fellows. The presence of *rouleaux* is always to be avoided. If the margin of the cover slip is smeared with vaseline, the preparation can be kept for a considerable time without change, and if the stage be kept at body temperature the changing nuclei, the flow of the granules, and the amœboid movements of the white cells will prove most instructive and interesting. We may also note the condition of the red cells and the presence or absence of nucleated red cells, we may estimate their hæmoglobin value and recognize the several varieties of the white cells, though with far less distinctness than by methods to be described. It is under these simple conditions that the plasmodia of malaria may be best studied, though the staining methods should not be omitted. Before going into these methods in detail, a few words concerning the cellular elements of the blood may not be amiss.

— Our views of the origin of the red cells and the nature of the different white cells and their granules have of late years undergone revision through the careful investigations of such men as Neumann, Rindfleisch, Malassez, Ehrlich, Bizzozero, Müller, Howell, and Osler. While there is still some difference of opinion in regard to detail, it is generally believed that the red cell is derived originally from colorless marrow cells; according to some observers, distinct in kind, though not in appearance from the large white cell. These cells undergo division, take up hæmoglobin, and finally appear as nucleated red cells. These cells again divide by karyokinesis and get rid of their nuclei by a process of extrusion (Rindfleisch, Ehrlich, and Howell), or they give off fragments by budding, retaining their nuclei. The fragments become the mature red cells (Malassez). Under some rather rare circumstances it is believed that the red cell arises in the spleen. There are also found in the blood minute, round, discoid, pale, or colorless particles, of about three micro-millimetres in diameter, which are deformed with great facility, frequently presenting prolongations of various forms, and more or less irregularity of border. These particles change with great rapidity and are best examined at a temperature approaching the freezing point. These bodies were first described by Zimmerman as "elementary particles." By Hayem they were considered "hæmatoblasts." Bizzozero called them "blood platelets," by which name they are generally known, and he believes that they have a special function in connection with the regeneration of the red blood-cell and with the formation of fibrinogen. They occur, according to Quain, in all vertebrates. They exist free in healthy

blood ; but are often massed when the blood is drawn (Osler). Their origin and functions are by no means clear (Foster, Quain), and, as they have not been shown to have any important clinical significance, we may dismiss them with the remark that they are more numerous in cachectic states than in health. The white cells of the blood are supposed to be of even greater importance than the red, in that they exert a very considerable influence on the blood plasma and help to maintain it in a proper condition. (Foster, Physiology, Part I.) Many of them are observed to contain granules, the exact nature of which is not understood. Some of these granules are probably of a fatty nature, since they have similar reaction and refraction, and dissolve in fat solvents. Others are shown to be proteid in character, and, under certain conditions, some are in the nature of carbohydrates. The power of white cells to absorb free particles in the blood is well recognized. They are frequently called scavengers of the blood, and are "engaged in carrying out changes in the proteids which prepare them for their various uses in the body" (Foster, *ibid.*), and in pathology they have a distinct rôle, not the least interesting of which is their phagocytic function, demonstrated by Metchnikoff. These granules are either food materials or waste products (Foster, *ibid.*).

In studying the granules contained in the various white cells, Ehrlich demonstrated that they possessed peculiar micro-chemical reactions, especially with certain aniline dyes. He divides these colors into two classes,—acid and basic dyes. In certain cells he found rather coarse granules, having a refractive appearance, not unlike fat granules, and from their affinity for the acid dye, eosin, he called them eosinophilic granules, and the cells containing them eosinophiles. Other cells were observed to contain granules finer and less refractive and because they stain by neither the acid nor the basic dyes, but by a combination of both, were named neutrophilic granules and the cells neutrophiles. Still other cells occasionally found in normal blood, but more frequently noticed in connective tissue in the neighborhood of vessels containing rather similar granules, but having an affinity only for basic dyes, were called basophilic granules and the cells basophiles. They are the "mastzellen" of the Germans. These cells have given rise to many errors, in that their granules resemble and take stain as do bacteria, and are constantly being mistaken for micro-organisms by those not fully acquainted with them. The rôle of the basophiles is not clearly understood at present, and, as they have no clinical report so far as known, we may dismiss them from our consideration.

By far the most valuable means of blood examination is that by staining after the so-called dry method of Ehrlich. A very thin film of fresh blood, as it issues from a puncture in the skin, is spread on a cover slip, and by being rapidly dried its cells retain their normal shape. The cover slip is then placed on a carefully-heated copper plate (about four by ten inches in size) at such a point that the temperature remains steadily at slightly

above boiling-point, say about 120° C., and left from a half to two hours. It may then be stained at once or kept indefinitely without change. This serves to fix the blood on the glass. Fixing may also be accomplished according to Nikiforoff's method of dipping the cover slip for thirty minutes in a mixture of equal parts absolute alcohol and ether, though the results are less uniform and reliable. After drying and fixing our specimen we may proceed to stain after any one of the numerous methods suggested,¹ but as every result necessary for clinical work may be obtained by one or two simple methods, others will not be mentioned. The acid dyes, such as acid fuchsin, eosin, aurantia, and nigrosin, stain the eosinophilic granules. The basic dyes, such as methylene blue, methyl green, methyl violet, Bismarck brown and fuchsin, stain the nuclei and basophilic granules of the "mastzellen," the bacteria and protozoa. By a combination of these colors we get a contrast stain which gives us a most clear definition of the various characters of the cells, occasionally of karyokinetic figures and the reticulum of the nuclei.

The simplest method is to stain our specimen from one to two minutes in a one-half per cent. solution of eosin in seventy per cent. alcohol, then wash, dry, and stain in a saturated aqueous solution of methylene blue, diluted in one-half water, for about thirty seconds, after which dry and mount in oil or xylol balsam. By this means we obtain a very clear picture and the white cells are easily differentiated. Ehrlich recommends, as superior to this, a triple stain, composed of acid fuchsin, orange green, and methyl green, called Biondi's stain, by which the nuclei are stained green, the neutrophilic granules violet or lilac, and the eosinophilic granules a bright red. This is an exceedingly satisfactory stain for beginners, as by it the slight differences in the transition forms are more clearly defined. For this stain Thayer² recommends the following formula :

Saturated aqueous solution acid fuchsin, 2;
 Water, 3;
 Add slowly, drop by drop, while shaking,
 Saturated aqueous solution orange green, 6.25;
 Saturated aqueous methyl green, 6;
 Then add—water, 15;
 Alcohol, 10;
 Glycerin, 5.

(This, Biondi's stain, may be purchased in the form of a powder or liquid, but it is inferior to the solutions made after the above formula.) In this solution the specimen is left from two to five minutes, then washed, dried, and mounted. The study of the white cells after staining demonstrates the existence of several varieties which have been variously classified

¹ Müller, Centralblatt für allgemeine Pathologie und pathologische Anatomie, October 31 and November 18, 1892.

² Boston Medical and Surgical Journal, February 16, 1893.

by workers in this field. Uskow has recently given us a very excellent classification, though the view on which it is based—that the various forms of leucocytes represent different stages of development and dissolution of cells derived from the lymphatic tissue, the spleen, and bone marrow—lacks proof and is by no means accepted. He divides leucocytes into three groups: (a) young elements, and of these recognizes three varieties: 1, small, transparent leucocytes; 2, small lymphocytes; 3, large lymphocytes: (b) ripe elements, and of these five varieties: 4, small transitional leucocytes; 5, large transitional leucocytes; 6, giant transitional leucocytes; 7, large transparent leucocytes; 8, giant transparent leucocytes: (c) over-ripe elements, divided into: 9, multinuclear leucocytes; 10, eosinophilic leucocytes, all of which are to be found in normal blood. Ehrlich has included all forms in five classes, but for every-day clinical work the classification of Hayem¹ is sufficiently practical and less confusing, especially as, with so many varieties, one form so closely resembles the one next related to it that its proper place in classification is difficult to determine. Hayem divides the white cells into four kinds,—

1. Small mononuclear leucocytes, including the small and large lymphocytes, the small transparent forms, and possibly some of the small transitional forms of Uskow.

2. Large mononuclear and transitional (intended) forms, which latter make a third group, according to Ehrlich.

3. Multinuclear neutrophiles.

4. Eosinophiles.

In conditions of health, the proportion of white cells to red cells varies greatly, but one to seven hundred and fifty is a fair general average. The proportion of white cells to one another, determined by counting stained specimens, is—

Small mononuclears.....	15-25 per cent.
Large mononuclears.....	6 "
Multinuclears	65-75 "
Eosinophiles.....	2- 5 "

Nucleated red cells are occasionally found in normal blood, but more frequently in the various anæmias.

In addition to these cellular elements, we have in pathological blood, cells resembling the red cells in general character, called by Ehrlich microcytes, each one containing a nucleus smaller than the red cell. Sometimes the cell is of the same size as the red cell and is called a normoblast. Occasionally the cell is very much larger and contains a faintly-stained nucleus; this cell is called a megaloblast. Another cell, noticed in splenic myelogenous leukæmia and not infrequently in typhoid fever, is moderately large, with a single, large, faintly-staining nucleus containing neutrophilic

¹ Du Sang, Paris, 1889, p. 104-106.

granules, which Ehrlich calls a myelocyte. It may be here remarked that our knowledge of the white cell as above outlined has enabled us to separate several distinct forms of blood-disease which were formerly included under the general name "leukocythæmia," as well as to follow the changes of blood secondary to local and general diseases.

We may now very briefly turn our attention to the application of these methods to clinical work. Ehrlich has well said¹ that in studying the pathology of the blood, "we stand in the favorable position of being able, during life, to note accurately the nature of the changes that are taking place," and it is the more reason that greater attention should be paid to this important subject. The simplest pathological condition of the blood is that of leucocytosis, by which, Eberth² says, "is understood a limited increase in the polynuclear leucocytes or of such white elements as are in normal blood." This condition is always of less high grade than leukæmia, and, indeed, in a slight degree is a normal one after meals when the products of digestion are being taken up by the blood. It is present in acute anæmias from hemorrhage and the most chronic anæmias secondary to disease. It accompanies or follows inflammation, suppurative processes, erysipelas, measles, scarlatina, diphtheria, acute articular rheumatism, and inflammation of serous membranes. It may be produced experimentally and results from infections of the blood from bacteria and the proteid substances produced by them and also by vegetable proteids. These usually cause at first a decrease of leucocytes, and later a more or less decided increase.³ Leucocytosis is characterized by the proportional increase mainly of the multinuclear neutrophiles and a decrease of the other white elements. It usually occurs in the course of croupous pneumonia, and its absence is to be looked upon as indicating an unfavorable prognosis. According to von Jaksch, Müller, and Eulenberg, there is a decided decrease in the number of leucocytes in typhoid fever.⁴ In some obscure cases it is essential to determine this point in order to distinguish between croupous pneumonia and typhoid fever,⁵ and it is often of great assistance in distinguishing between typhoid fever and acute miliary tuberculosis. In tuberculosis, leucocytosis is more or less constant. Uskow states that, in his experience, the increase was in the multinuclear elements and a relative diminution of the small mononuclear elements. Rieder says the white elements are either normal or slightly increased.⁶ v. Nasse, Samuel, and others have described a high degree of leucocytosis in progressive tuberculosis with fever.⁷ In chlorosis the number of cells is not at all or but slightly diminished. There is, however, a marked diminution in the hæmoglobin value of the reds. The proportion

¹ Friedländer's *Mikroskopische Technik des Begriffs Leukocytose*.

² *Ibid.*

³ Rieder, *Beiträge zur Kenntniss der Leukocytose und Verwandter Zustände des Blutes*, Leipzig, 1892, p. 198.

⁴ *Ibid.*, p. 202.

⁵ Rieder, *op. cit.*, p. 153.

⁶ *Ibid.*

⁷ *Ibid.*

of white cells remains practically unchanged. In severe cases we note the irregularity in the shape of the red cells called poikilocytosis. In idiopathic or progressive pernicious anæmia we have almost the opposite condition to that found in chlorosis. The cellular richness of the blood, both in whites and reds, is very greatly diminished, while the individual cells retain and may even increase their hæmoglobin. The red corpuscles show most decided changes in size and shape. The megaloblasts of Ehrlich are a constant feature and are often numerous, and the cells are distorted, showing most marked poikilocytosis. Occasionally microcytes are found and are regarded as degenerative forms. The number of white cells is lowered and the proportion of one to another is, according to Thayer,¹ greatly changed, mononuclears being increased. The large mononuclears and polynuclears are relatively diminished. There are distinguished several forms of leukæmia, which cannot be accurately diagnosed without reference to the condition of the cellular elements of the blood. In the lieno-medullary form the large leucocytes prevail; in the lymphatic, the small mononuclears; in the myelogenous, large cells with large nuclei, a large number of cells transitional between white and red, and the very unusual number of eosinophiles is a most striking feature.² In lymphatic leukæmia, the lymphocytes form a very large portion of the white cells, reaching sometimes as high as ninety-seven per cent.³ The large number of red cells is very decidedly diminished and the proportion of white to red cells sometimes is as high as one to ten. Nucleated red cells are rare. In the myelogenous and especially the lieno-medullary forms occur cells which do not appear in normal blood. These myelocytes are often abundant and may reach the proportion of one to four, and the white cells sometimes equal the red cells in number. In pseudoleukæmia, or Hodgkin's disease, there is no diminution of the hæmoglobin and no leucocytosis in the early stages; while in the last stages we always have a lowered hæmoglobin value and a decreased number of red cells, sometimes to an extent approaching leukæmia.⁴ A disease of the blood confined to children, called anæmia infantum, pseudoleukæmia, described by von Jaksch, is characterized by absence or a greatly decreased proportion of eosinophiles. The other white elements are greatly increased, and the red cells may be diminished to a very low number. Increase of the leucocytes is not so great as in leukæmia, but they display a great variety of form and attain an unusual size. Poikilocytosis is marked and the red cells have a low hæmoglobin value. Some leucocytes have been observed holding red cells or fragments of red cells in their substance.⁵

There are still many states of the blood it would be most interesting to

¹ Thayer, *ibid.*, February 23, 1893.

² v. Jaksch, *Prager medicinische Wochenschrift*, 1890, No. 32.

³ Thayer, *ibid.*

⁴ v. Jaksch, *ibid.*, No. 33.

⁵ *Ibid.*

consider, such as its condition in lithæmia, rheumatism, gout, nephritis; etc., but space does not permit a discussion of these points, nor of the influence of vegetable and organic toxic substances, of the protozoa which occasionally infest it, and especially of the changes wrought by the various forms of infection by bacteria and their toxins: these constitute a very large branch of the subject, of too great importance to be treated as subsidiary. It would not, however, be proper to close without saying a word concerning the malarial micro-organism. There have been no investigations of the blood which have yielded more brilliant and valuable clinical results than those pertaining to malaria. The discovery of the essential cause of malaria in the *plasmodium malarie* has opened the way to an early diagnosis in an important class of cases hitherto obscure. In the early stages of certain fevers an examination of the blood and the determination of the presence or absence of malarial plasmodia is a positive guide to correct diagnosis and appropriate treatment, enabling us to distinguish nearly, if not quite, at the outset between a malarial fever and a commencing typhoid. v. Jaksch believes that in a given case, in the presence of pigment-bearing leucocytes with oligochromæmia and oligocythæmia, but without plasmodia in the blood, we are justified in concluding that the cachexia is of malarial origin.

There is much concerning this subject that is still obscure. Great advances have been made in recent years in our knowledge of the varying conditions of the blood, and by applying with exactness and care in regard to detail the methods of examination above outlined, we may obtain uniform and reliable results of the greatest possible value in our daily clinical work.

¹ v. Jaksch, *ibid.*, No. 32.

SYMPOSIUM ON DIPHTHERIA.

A REPORT OF THE MEETING OF THE PHILADELPHIA PATHOLOGICAL SOCIETY HELD
MARCH 28, 1895.

THE BACILLUS DIPHTHERIÆ AND SOME OF THE CHARACTERISTICS BY WHICH IT MAY BE IDENTIFIED.

REMARKS BY A. C. ABBOTT, M.D.,

First Assistant, Laboratory of Hygiene, University of Pennsylvania.

MR. CHAIRMAN AND GENTLEMEN OF THE SOCIETY,—The portion of the discussion that has been allotted to me to-night does not admit of my bringing to your notice anything of which you have not already heard from other sources, or anything that is not now to be found in modern textbooks on bacteriology.

In view of this fact I have thought it advisable to utilize the time allowed me by making a general demonstration rather than by presenting to you a formal paper on the subject. I shall not, therefore, make many allusions to the important literature bearing upon the historical development of our knowledge of diphtheria and its etiology, but shall confine myself strictly to an objective consideration of the morphological, cultural, and pathogenic peculiarities of the Klebs-Lœffler *bacillus diphtheriæ*, and wherever possible will supplement the remarks by the exhibition of illustrative specimens or diagrams.

If in the course of our studies upon diphtheria as it occurs in man one scrapes from the diphtheritic deposit in the fauces a minute particle of the false membrane and smears it upon a cover slip, dries and stains it, one will find upon microscopic examination that there is present a variety of bacteria of different morphology; some of them being spheres, others coarse rods, some long and others short. Associated with this heterogeneous collection, however, a group of organisms will be observed the individuals of which, though differing in outline the one from the other, have, nevertheless, more or less of a general family resemblance to one another. Some of them will be spindle-shaped; others will be like little dumb-bells; pairs of lancet-shaped bodies joined at their broad extremities will present; again short rods appearing to be made of shorter segments will be noticed, and, in addition, a number of irregular, clubbed, flask-shaped, and bizarre varieties may be detected in the field. These are the diphtheria bacilli, and it is by their marked lack of uniformity in outline that one identifies them in the scrapings from the diphtheritic false membrane. Not only does the irregularity in their outlines point to their nature, but the peculiar manner

in which they take on the staining material is an important aid to their identification. They are rarely stained uniformly, but, as a rule, are seen to present alternating faintly and deeply stained areas, and not rarely present a peculiar appearance, consisting of the presence of minute, round, deeply-stained, almost black dots or points at different parts of their protoplasm.

The diphtheria bacillus grows well on the majority of artificial culture media, but on some much more rapidly and luxuriantly than on others. It is easy, therefore, to obtain a growth of the organism by smearing a bit of the diphtheritic false membrane over the surface of suitable nutritive media and retaining this at the temperature of the body. The growth thus obtained is not, however, a pure culture of this organism, but is usually mixed with colonies developing from some of the other organisms associated with the *bacillus diphtheriæ* in the pseudo-membranes.

The medium that is most satisfactory for the cultivation of this organism, and through the employment of which it can be most easily isolated from the throat in pure culture, is the solidified (coagulated or gelatinized) blood-serum mixture recommended by Lœffler, which consists of a mixture of three parts of blood-serum and one part of neutral or slightly alkaline nutritive bouillon, containing one per cent. of glucose.

If one inoculates a tube of blood-serum with a particle of membrane from the diseased throat, and keeps it at the temperature of the body, there will appear upon the surface of the serum in from twelve to eighteen hours a number of dull, dense, whitish or yellowish-white points of from five-tenths to one millimetre in diameter. These, as a rule, represent colonies of the diphtheria bacillus, from which it is easy to obtain, by appropriate means, the organism in pure culture.

There will also be seen on the surface of the serum smaller points of different appearance, which represent colonies of other organisms with which the *bacillus diphtheriæ* was associated. They are rarely as far advanced or as conspicuous as the colonies of *bacillus diphtheriæ*, and it is this distinction between the diphtheritic bacillus and the non-diphtheritic organisms in their rate of growth on blood-serum that renders this medium such an important aid to the rapid detection and isolation of the *bacillus diphtheriæ*,—it grows much more rapidly, as a rule, on blood-serum than do the other bacteria with which it is commonly associated.

If the diphtheria bacillus be isolated in pure culture on blood-serum and kept at 38° C. for three or four days, the appearance presented by its individual colonies is that of round, elevated, grayish-white, or yellowish-white masses of from one to three millimetres in diameter. They are usually slightly elevated at the centre, where they are denser than at the periphery. The surface of the colony is at first slightly moist, but gradually becomes dull and dry in appearance. Sometimes cultures will be encountered that gradually take on a yellowish appearance, often becoming decidedly yellow after a week or ten days.

If one makes a similar inoculation from the membrane in the throat on

agar-agar, one finds, after twelve to eighteen hours at the temperature of the body, that here colonies will be seen, many of which are conspicuous for their size, while others will be so small as hardly to be discernible by the naked eye. The conditions found, however, on microscopic study, will be just the reverse of those seen on the blood-serum tube. Here the diphtheria bacilli develop very slowly and are among the smallest of the colonies, while the other bacteria, in which we are not interested, grow rapidly and usually go to form the larger, more conspicuous colonies.

If the colonies of *bacillus diphtheriæ* be studied on plates of nutrient agar-agar, and especially agar-agar to which six per cent. of glycerin has been added, they will be found to pass through a series of interesting and characteristic phases in the course of their development,—beginning as microscopic, coarsely granular masses in the depths of the medium, they ultimately reach the surface as growth progresses, and spread laterally over the surface, giving rise to small, very thin, dry, irregularly-scalloped or serrated pellicles that often present a number of longer or shorter cracks or rents extending from the periphery towards the centre. Under the microscope they are now usually marked by a dense central mass, the original colony around which has developed, and spread laterally for one or two millimetres, the thin pellicle above referred to.

The appearances of the colonies of *bacillus diphtheriæ* on glycerin agar-agar are represented in Fig. 1. It is important to familiarize one's self with this characteristic, as it is of a great deal of aid in the identification of the organism.

Another medium in which this organism grows in a more or less characteristic fashion is bouillon. The bouillon is not uniformly clouded, as a rule, but presents the appearance of a clear, transparent fluid, in which, when shaken, small, white clumps are seen to have settled to the bottom. Sometimes, however, there is a uniform clouding, but if a drop of such a culture be examined microscopically in the form of a "hanging drop," it will be seen that the clouding is due to the presence of clumps of bacteria, too small to be detected by the naked eye, and probably of such low specific gravity that they do not readily settle to the bottom of the liquid.

In ordinary neutral bouillon the reaction is changed to acid by the growth of this organism, which acid reaction ultimately (after a week or ten days) gives way to alkalinity, which is permanent. There are exceptions to this.

It grows on ordinary nutrient gelatin, but so slowly that this is not considered a favorable medium to employ for its isolation. Its colonies on gelatin do not reach their full development much before a week. When fully developed they appear as elevated, dense, slightly umbilicated, round masses that are more or less distinctly marked by concentric rings.

It grows on potato, and presents usually a condition analogous to that given for the genuine *bacillus typhi abdominalis* as seen on this medium,—viz., the growth is invisible, though it may be tolerably abundant. At

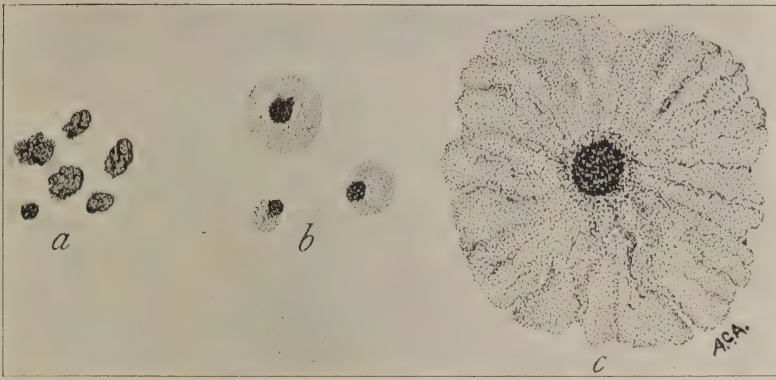


FIG. 1.—Colonies of *Bacillus diphtheriae* on six-per-cent. glycerin agar-agar, in various stages of development (a, b, c).

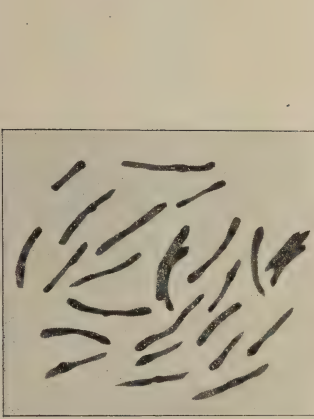


FIG. 2.—*B. diphtheriae* on Loeffler's alkaline blood-serum.

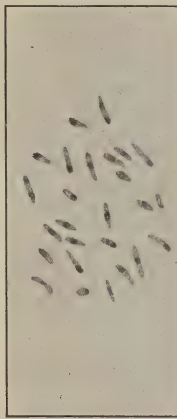


FIG. 3.—*B. diphtheriae* on acid blood-serum mixture (Loeffler's).

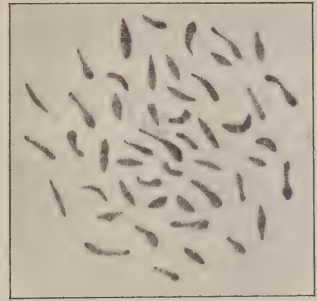


FIG. 4.—*B. diphtheriae* on six-per-cent. glycerin agar-agar.

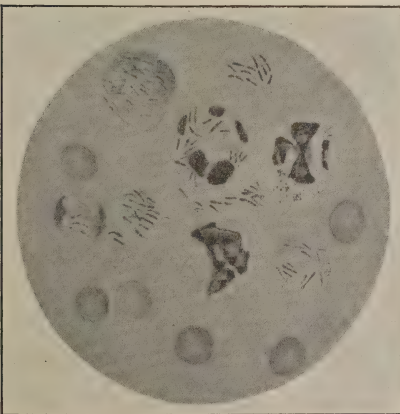


FIG. 5.—Microscopic appearance of a cover-slip preparation from site of inoculation of guinea-pig dead of experimental diphtheria.

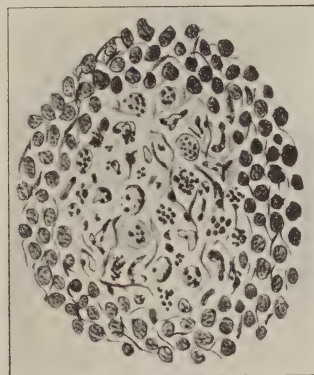
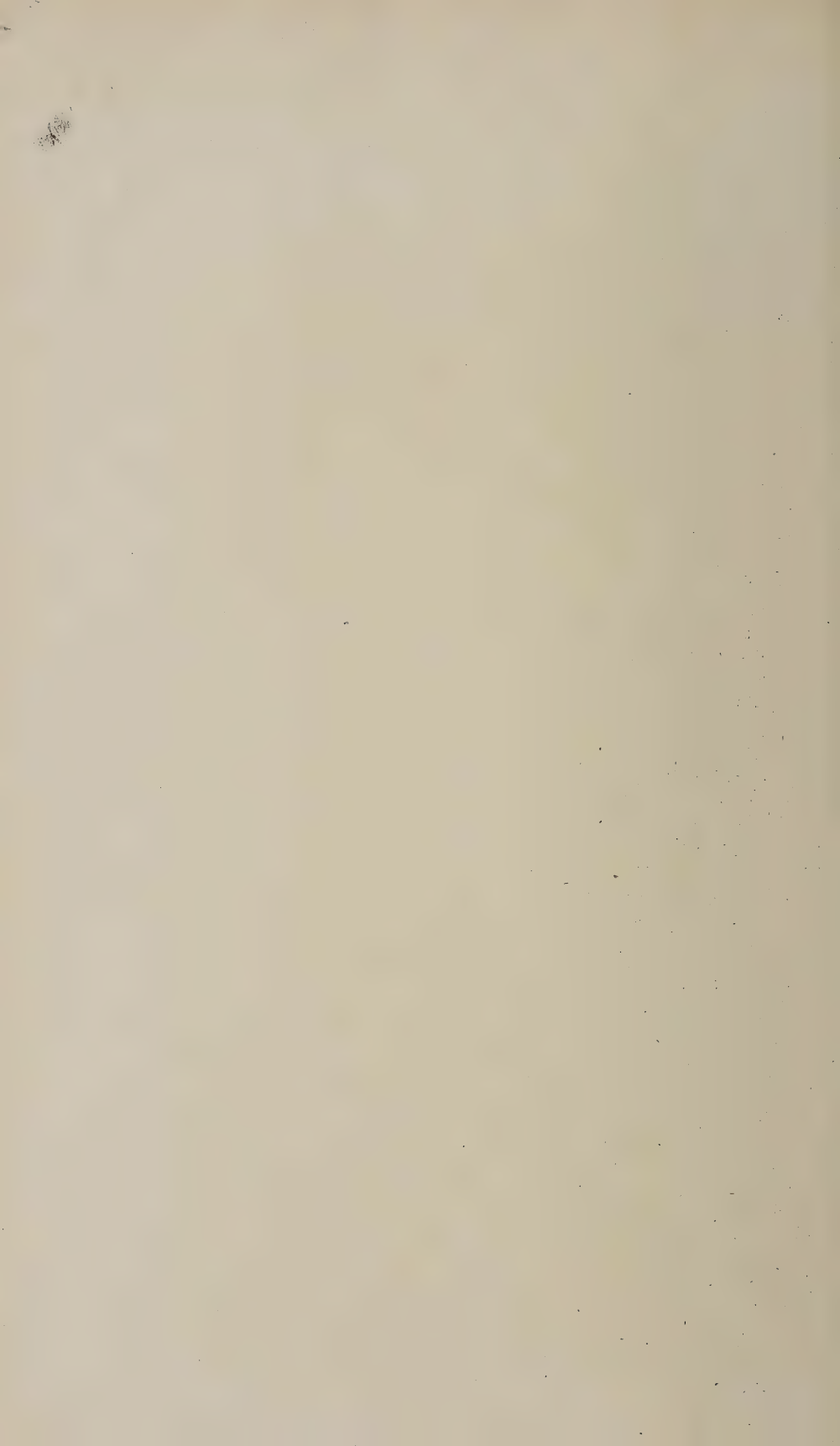


FIG. 6.—Diagram showing necrotic area in spleen.



times cultures are encountered that grow slightly visible on potato; it then appears as a very thin, dull, dry deposit at the point inoculated.

It grows with varying degrees of luxuriance in the other media used in the laboratory, but those mentioned are the most important for its study under artificial conditions of cultivation. It does not possess the property of independent motion, nor is it one of the spore-bearing organisms.

It is destroyed by an exposure of ten minutes to a temperature of 58° C., but grows at temperatures ranging from 22° C. to 38° C., the development being most active at the latter point.

Of primary importance in the recognition of this organism is an acquaintance with its morphology under varying conditions of artificial environment.

It is impossible to say just what its normal morphology is, for one rarely encounters the organism when all the individuals are of uniform shape and size.

As obtained directly from the throat, the predominating form is perhaps that of a slender lancet or spindle. This changes more or less according to the medium on which it is cultivated. For example: On solidified blood-serum of alkaline reaction it appears in the form of comparatively long, irregularly staining threads that are sometimes clubbed at one or both ends, sometimes bulged out at or near the centre, and sometimes pointed at the extremities; often single bacilli will be found that appear as if broken at or near the middle. Many of these irregularly-stained bacilli may present one or more points that take up the staining much more deeply than the balance of the cell, so that they look as if marked by black or very dark blue round points. (See Fig. 2.)

In studying these morphological changes it must be remembered that the bacilli of greatest length and irregularity of staining are obtained from cultures on alkaline blood-serum that has been solidified (gelatinized) by the old method (Koch's),—viz., fractional sterilization, and, finally, long-continued heating (from one to three hours) at 80° to 85° C. On blood-serum prepared by Councilman's method—that now commonly used,—viz., rapid coagulation at high temperature with subsequent sterilization by steam—the morphology of the bacilli is shorter, while on coagulated egg albumen (hard-boiled egg) the rods are still shorter.

If instead of blood-serum of alkaline reaction one employs a serum that has been very slightly acidified (not sufficiently so to arrest growth), one encounters an alteration in the morphology of this organism that is both striking and peculiar. The cells here appear to be regularly swollen, to be much shorter, oval cells predominate, and all stain in a remarkable way. Instead of the staining being taken up in the irregular way seen in the culture on alkaline blood-serum, the bulk of the cells from the slightly acid serum are only very faintly tinged except at one point (usually). At this point, which may be at either end or at the centre, the staining is taken up very readily, so that the cell appears as a very faintly tinted oval body, in

which is an intensely stained, small, round point. Very few conspicuously irregular forms will be found in cultures on the acid serum. (See Fig. 3.)

Another striking appearance of this organism is that obtained from glycerin agar cultures (six per cent. glycerin). Here the cells are smaller and much more regular in contour than on any of the other media. They are quite small, are lancet- or spindle-shaped, are sometimes clubbed, and stain tolerably regularly. They present throughout an appearance suggestive of their being composed of very short segments. Many of the stained cells contain deeply-stained points. (See Fig. 4.)

On agar-agar without glycerin, on gelatin and in bouillon, the morphology is about intermediate between the extremes seen on alkaline blood-serum, on the one hand, and that on glycerin agar on the other.

Long, irregularly staining, clubbed, and curved forms similar to those that are constantly seen upon Loeffler's blood-serum, even after only twenty-four hours at the temperature of the incubator, are often referred to collectively as involution or degenerate forms of this organism; but I feel justified in questioning the accuracy of this view; at all events, it is difficult to reconcile the voluminous growth of this organism, as seen upon blood-serum after twenty-four hours, with the opinion that the organisms of which it is composed are in a condition of degeneration.

To what these variations are due it is impossible at this time to say. Experiments have been made with the view of shedding some light on the subject, but as yet the results are not satisfactory.¹

The bacillus of diphtheria stains readily with all the basic aniline dyes. The stain most commonly used is the alkaline methylene blue solution of Loeffler. It retains the stain when treated by the method of Gram. (Cultures and specimens illustrating these conditions of morphology and growth were exhibited.)

Of greatest importance in contributing to our knowledge of the relation of the *bacillus diphtheriæ* to diphtheria in man are the observations that have been made upon animals inoculated with cultures of this organism. As a result of these studies we know that diphtheria is primarily a local trouble, and that the general symptoms and remote pathological lesions are the result, not of the presence of the diphtheria bacilli throughout the body, but rather of poisons that are produced by the bacilli at the seat of local trouble in the throat, and which poisons, when disseminated through the circulating blood, possess the power of setting up a group of lesions in the internal organs now recognized as one of the characteristics of this malady.

If one inoculate a guinea-pig subcutaneously in the abdominal wall with a small portion of a pure culture of the virulent diphtheria bacillus, one finds that after twenty-four hours the animal is manifestly unwell. It

¹ See paper by the author, "Inoculation of Milch Cows with Cultures of the Bacillus Diphtheriæ," Journal of Pathology and Bacteriology, Edinburgh and London, October, 1893.

will sit in the corner of its cage with the nose depressed, its back humped, the hair roughened up, and is disinclined to move. If laid on its side it may have difficulty in regaining its feet. If the hand be passed over the site of inoculation, tumefaction with œdema of the surrounding tissues is readily felt. At the end of thirty-six to forty-eight hours the animal is usually dead. The autopsy reveals an extensive œdema of the subcutaneous tissues, extending often from the pubes to the chin; the subcutaneous lymphatic glands, in both inguinal and axillary regions, are enlarged and red. Immediately at the site of inoculation the skin is found to be bound down to the underlying tissues by a more or less dense, yellowish-gray patch of necrotic tissue that is everywhere marked with minute points of hemorrhage. It is from this necrotic mass, in the immediate neighborhood of the point at which the bacilli were deposited, that they may be recovered by culture methods, and that they may be found on microscopic examination. In the cover slips made from the necrotic tissues at the site of inoculation one commonly finds numerous leucocytes, the nuclei of which are in various stages of disintegration and distortion, manifestly the direct effect of the poison that is being produced by the bacilli growing in the immediate neighborhood. Again, it is common to find at this point phagocytes containing diphtheria bacilli, many of which are advanced in degenerate changes. (See Fig. 5.)

At a distance of but two or three centimetres from this point one may fail to get the bacilli. They are not disseminated throughout the œdematous tissues, and are not usually found in the nearest lymphatic glands. The histological structure of the fibrino-purulent, necrotic tissues at the site of inoculation is essentially that of the diseased area in the throat of diphtheritic human beings.

On opening the great serous cavities it is common to find them (one or both) containing more or less of clear serum, sometimes but a cubic centimetre or two, again they may be almost filled. The small intestines may appear normal to the naked eye, or they may be œdematous and filled with clear or blood-stained fluid. Often their lymphatic apparatus is prominent and evidently affected. The liver may appear normal, or it may present minute, irregular, white markings, ranging in size from about that of a pin's point up to areas of one to three millimetres in diameter. Similar areas may be seen to be scattered through the organ on section. The spleen may be normal, or may present areas similar to those seen on the liver. The kidneys do not often present naked-eye changes, though at times pale points may be seen on them too.

The adrenal bodies are practically always enlarged and markedly congested, and on section are found to be filled with a dark, blood-like mass. The retroperitoneal lymph-glands are enlarged and reddened.

Very commonly groups of ecchymoses may be seen at different points on the peritoneum, especially that covering the abdominal wall just beneath the site of inoculation, and upon the diaphragm. The lungs are not com-

monly altered in appearance. The pericardial sac is often distended with clear fluid, and the tissues of the anterior mediastinum are usually oedematous.

The study of the internal organs and the blood of these animals by bacteriological methods does not, as a rule, reveal the presence of bacteria. By the use of larger amounts of material than are usually employed in making cultures one may succeed in detecting the bacilli in the internal organs. They are always few in number, however, and are most probably present as a result of being carried there by the blood-current from the site of inoculation. At all events, we have no evidence to justify the opinion that their appearance in the internal organs is of necessity followed by diseased conditions that can be attributed to their immediate presence.

The irregular pale areas referred to as appearing in the liver, spleen, and elsewhere represent a very peculiar form of necrosis, to which Oertel¹ first called attention, in the cadavers of human beings after death from diphtheria, and which Welch and Flexner² have since detected in the bodies of animals dead of the experimental form of the disease. These changes consist of foci of a peculiar form of necrosis, varying in extent and scattered irregularly through the internal organs. They are characterized by fragmentation of the nuclei of the cells of the parts affected. The fragments into which the nuclei are seen to disintegrate are conspicuous for the readiness and intensity with which they become stained and for the manifold shapes which they are seen to assume, at times appearing as little else than dust-like particles strewn through the necrotic and hyaline area, or again as clusters of granules indicative of the location of the nucleus from which they originated; again, all manner of irregular and bizarre shapes that may be likened to whetstones, crescents, balloons, clubs, dumb-bells, etc., will be seen. Frequently a nucleus will appear as if drawn out so that it may present a tail-like elongation, and again it may be pinched and distorted. In certain spots there may be almost an absence of stained cells and fragments, but it is usually possible to detect faint outlines of cells and more or less of a refractive, granular substance that gives the staining reaction of fibrin. In the investigations of Oertel and of Welch and Flexner these necrotic areas in greater or less extent have been detected in all the internal viscera, being particularly prominent in the lymphatic apparatus, in the liver, and in the spleen. To a limited extent the same process was also detected in the muscles of the heart. While not strictly confined to the disease, diphtheria, this nuclear fragmentation is nevertheless always an accompaniment, and affords, by the rapidity with which it is produced, another illustration of the energy of action possessed by the poison pro-

¹ Oertel, "Die Pathogenese der epidemischen Diphtherie. Nach ihrer histologischen Begründung." Mit Atlas. Leipzig: Vogel, 1887.

² Welch and Flexner, "The Histological Changes in Experimental Diphtheria." Johns Hopkins Hospital Bulletin, No. 15, August, 1891. Also, "The Histological Lesions produced by the Toxalbumen of Diphtheria," *ibid.*, No. 20, March, 1892.

ducing it. (See Fig. 6.) It has been seen to occur in the internal organs of animals with all its characteristics in so short a time as thirty-eight hours after inoculation with small quantities of cultures of the *bacillus diphtheriæ*.¹

The poisons produced by the bacilli at the seat of primary invasion, to the absorption of which, as has been said, the secondary manifestations and constitutional symptoms are due, are likewise produced by the bacilli when growing under artificial conditions of cultivation.

When isolated, free from the organisms by which it was manufactured, it is seen to be capable of causing in susceptible animals identically the same group of tissue-changes that are produced when the bacilli themselves are introduced.

As bacteriological study of diphtheria and conditions with which it might be confused met with wider application certain irregularities were encountered. It was discovered that the causative factor, the genuine *bacillus diphtheriæ*, was simulated in morphological and biological peculiarities by what was believed to be another organism which was distinguishable from it only by the absence of pathogenic properties. This latter organism was known as the pseudo-diphtheritic bacillus, and was considered as distinct from the genuine diphtheritic bacillus simply because of its inability to kill susceptible animals when inoculated into them subcutaneously. As this organism had been seen in conditions not believed to be diphtheria, as it had been seen in mild cases of a doubtful nature, and as it had been seen in genuine diphtheria in association with the true diphtheria bacillus, it became necessary to determine its relation to the virulent *bacillus diphtheriæ* before the value of the latter organism as an absolute means of diagnosis could be firmly established. The simplest way out of the difficulty was to consider them as in no way related, but as entirely distinct species, and this, in fact, is what was done.

It was, however, soon observed, that the genuine, virulent diphtheria bacillus was liable to fluctuate in the degree of its pathogenic properties, at times possessing these to such an extent that when inoculated into guinea-pigs death resulted in from thirty-six to forty-eight hours, while again the period of incubation was much longer, often reaching five or six days, and in not a few cases organisms were obtained from undoubted cases of diphtheria that failed to give more than a temporary local reaction when inoculated into these animals. In many cases of diphtheria the two organisms have been seen to be simultaneously present, and in the observations of Roux and Yersin it was detected that as the disease advanced towards recovery the number of the less virulent and non-virulent forms became more numerous in proportion. Singular as it may seem, the only or principal point

¹ At this point autopsies were performed on guinea-pigs dead from diphtheria and the naked-eye lesions demonstrated. Sections of tissues showing the foci of cell-death were also exhibited under the microscope.

of distinction between these two organisms, if distinct they are, was held to be the ability of the one and the inability of the other to cause the death of the inoculated animals, and no attention whatever was paid to the nature of the local reaction that was caused by the organism that failed to kill. I have taken occasion to examine the condition of the tissues at the seat of inoculation in animals into which non-virulent forms of this organism had been introduced, and have found that, though the death of the animals did not follow the inoculations, locally, tissue-changes indistinguishable, save in degree, from those produced by the fully virulent forms were to be found; there was the same œdema, though less in extent, the same hyaline condition of the muscle-fibres, the same fibrin exudation, and the same characteristic fragmentation of nuclei that one finds locally in the animals inoculated with the true, fully virulent bacillus of diphtheria. This, I think, offers another argument in favor of the opinion already expressed elsewhere by Roux and Yersin, myself and others, that the diphtheritic bacillus and the so-called pseudo-diphtheritic bacillus are one and the same organism, the latter representing the former, whose virulent properties have become diminished.

In closing this demonstration I wish to apologize for the number of points in connection with this organism, and the conditions produced by it, that have been either ignored or insufficiently dwelt upon; but as the time at my disposal is limited I must ask your indulgence, and hope that at some time in the future an opportunity may again present for me to ask your attention to an object-lesson upon this interesting topic.

PREPARATION OF THE DIPHTHERIA ANTITOXIN.

REMARKS BY JOSEPH MCFARLAND, M.D.,

Demonstrator of Pathological Histology in the University of Pennsylvania.

The beautiful demonstration by Ehrlich of the production of an antitoxic substance in the blood of animals gradually immunized to ricin was one of the foundation-stones upon which Behring and Roux have built up the new theory and practice of the treatment of diphtheria.

Whatever exceptions may be taken to the antitoxic treatment as a method of alleviating the sufferings of our patients, it must be granted by all that it is one of the most scientific and interesting methods ever suggested, as well as the only one capable of positive demonstration upon animals with mathematically accurate results. However, I accepted the invitation to speak upon the antitoxin this evening with the direct understanding that its therapeutic merits were not to be discussed from the clinical or statistical aspects. I shall therefore devote myself to the laboratory experiments exclusively.

The theory of antitoxins as now generally accepted is that the body-cells of immune or partially immune animals are able, under proper stimulation, to produce a substance capable of annulling the effects of certain poisons. Sometimes, indeed generally, the stimulation of the cells depends upon the presence of the poisons to be neutralized. In the preparation of the antitoxins we make use of this fact, and accustom the animals to gradually increasing amounts of it, until the doses administered are so great that the immediate disorganization of nervous centres and necrosis of tissues all over the body would result, if the tissues were not able to produce a corresponding amount of a neutralizing substance. Ehrlich found this the case with ricin. As long as the amounts introduced were within a certain limit the animal simply endured them, but when the endurance was no longer able to cope with the increasing experimental dosage, the tissues began—and, as he found, suddenly began—to effect a neutralization. That which Ehrlich showed for ricin, Behring has shown to be true of the diphtheria toxin. Animals endure small doses, gradually accustom themselves to increasing doses, and neutralize the large ones.

The stimulation which produces antitoxin may also result from the presence in the tissues of the antitoxin itself. We can scarcely suppose that the one-hundredth cubic centimetre of antitoxin which we introduce into a poisoned guinea-pig, or the few cubic centimetres which we inject into a diseased child, can penetrate all the tissues and effect a universal neutralization of a circulating poison. Much more rational seems the conclusion that the introduction of a given amount effects some neutralization *per se*, but that the great work is accomplished by a stimulation of the depressed, inactive body-cells.

One fact of prime importance is never to be forgotten when theorizing upon antitoxins,—*the blood of immune animals does not normally contain a trace of it.* It has been suggested by many, and I have been asked again and again what effect the injection of ten cubic centimetres of simple serum from the horse would have upon a case of diphtheria. *It would not have any effect.* The rat is a much more immune animal than the horse, and seems immune to any dose of diphtheria toxin, yet Kuprianow has shown that the blood-serum of the rat does not contain a particle of antitoxin and does not offer the slightest protection to guinea-pigs or mice when introduced into their bodies in considerable amounts.

Diphtheria is a disease whose pronounced symptoms are due to a violent toxæmia. The bacilli which cause it produce a local lesion where they multiply, but this is generally a mild inflammation in uncombined cases, dangerous only as a mechanical obstruction to the respiration, and is practically nothing in comparison to the results of the absorption of the toxins.

That the bacilli operate by toxins was first shown by Roux and Yersin, who found filtered cultures to be fatal to susceptible animals. It remained, however, for Behring to give us a correct estimate of the strength of the toxins. Behring's experiments upon this subject were made with toxins

from a flask containing a very old bouillon culture of the *bacillus diphtheriæ*. This flask had been inoculated, and stood away in his incubator for two years before being tested. When opened it was perfectly sterile, the bacilli having long since died, but its alkalinity was great and its toxic property of high virulence. Of this toxin he found that one-tenth cubic centimetre was fatal to a five-hundred-gramme guinea-pig in about twenty-four hours. This flask furnished the material for many of Behring's experiments, although what is generally called his "standard toxin" is five-tenths cubic centimetre of a bouillon culture two days old.

The preparation of the toxin, according to Behring, was simple. Ordinary flasks of bouillon were inoculated, stood away in the incubator, and examined from time to time. As is well known, these flasks first are alkaline, but soon become acid as the bacillus develops. When the culture grows old and the bacilli cease to multiply, the alkalinity returns and marks the acme of toxin production. According to Behring, this takes about six, sometimes eight, weeks.

As the consumption of toxin in the preparation of antitoxin is great, a large amount must always be on hand, and a method which can provide it in a shorter time is desirable. Fernbach, observing an important fact in connection with the biology of toxic bacteria, has given us a new method of producing toxin which has met with excellent results in the hands of Roux. This method depends upon the exposure of a large surface of a liquid culture to a passing current of atmosphere. By this means the longevity of the bacilli is greatly diminished, their multiplication stimulated, and their disintegration accelerated, and a greatly-improved toxicity of the culture results, for, as the bacilli produce the toxin and liberate it when disintegration occurs, the increase in number and accelerated destruction greatly favor its production.

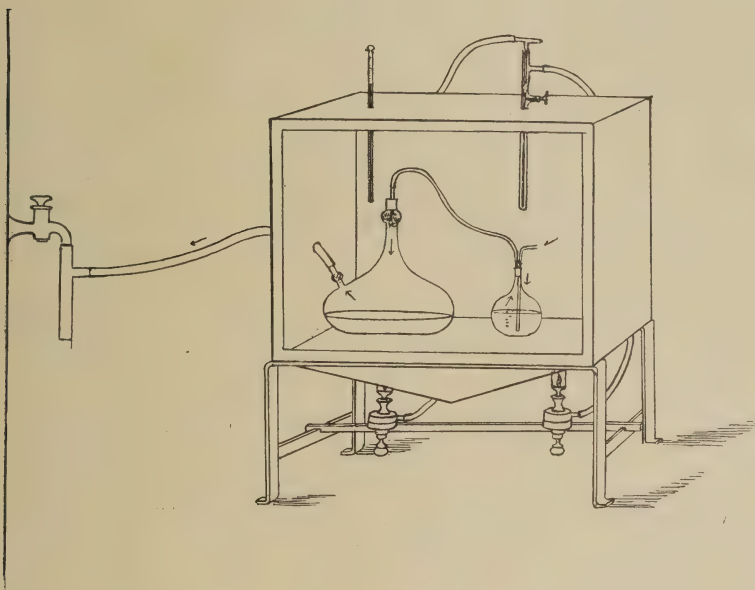
For the prosecution of this method a special flask—rather a number of special flasks—has been devised. I am not sure that I have seen the original Fernbach flask; that which I employ being a form of it, the pattern of which I secured from Dr. J. J. Kinyoun, of the United States Marine Hospital Service. After sterilization and inoculation the cotton stoppers which have closed the neck and tubulature are burned, then pushed down into a bulbous expansion below, and a sterile, perforated cork with a glass tube introduced above each. Rubber tubes are connected with the glass tubes in the corks; that in the tubulature being attached to a suction-pump; that in the neck with a wash-bottle, so that when the pump is started a stream of fresh, moist air passes through the flask from neck to tubulature, and constantly aerates the culture. (See Fig. 1.)

The New York Board of Health have a modification of Fernbach's flask, which I use, but which I do not like nearly as well as the one shown in the illustration.

The chief difficulty in the use of all flasks with passing air-currents is the danger of contamination. In that first described the danger is in part

removed by the cotton plugs which act as filters, but, as every one knows, the spores of moulds will occasionally work unexpected havoc in cotton, so that now and then one unexpectedly finds his flask contaminated. At first I

FIG. 1.



Incubator containing a culture of the diphtheria bacillus in the modified Fernbach flask, as shown to the writer by Kinyoun.

lost a number from moulds and the hay and potato bacilli, but now every precaution is taken; the flask is sterilized preferably with its cotton stopper protected by a little hood of cotton, which is only removed for filling and for inoculation. The rubber tubes are sterilized with carbolic acid, connected with the glass tubes and corks, and then boiled. When connected, a sterile cotton plug should be kept in the open tube of the wash-bottle, a sufficient amount of bichloride solution is added to the water in the wash-bottle to prevent moulds from growing in it, and I prefer to introduce a sterile flask between the pump and the large flask, so that any accidental regurgitation or the downward flow of any water of condensation from the tube may cause no danger.

The cultures in these flasks are grown in a strongly alkaline bouillon, and must be *virulent* cultures. There can be no more important principle laid down than that it requires a *highly virulent* culture to produce a powerful toxin. The culture chosen should be one of which one-half centimetre of a bouillon culture two days old will kill a standard guinea-pig (five hundred grammes) in from twenty-four to thirty hours.

While the bacilli grow and produce toxin, the flasks are kept in an incubator at the temperature of 37°C ., and the current of air allowed to pass through. The production of toxin requires about three weeks.

The cultures grown in such flasks are much more massive than one ordinarily sees, and a rather thick mycoderm often forms. This mycoderm is not perfect but ragged, fragments hanging from it and often dropping off. If the flask be moved the growth on the surface, being very brittle, at once breaks up into small fragments which soon sink. I think observation will bear me out in the assertion that the greater the amount of surface growths, the greater the toxicity of the culture.

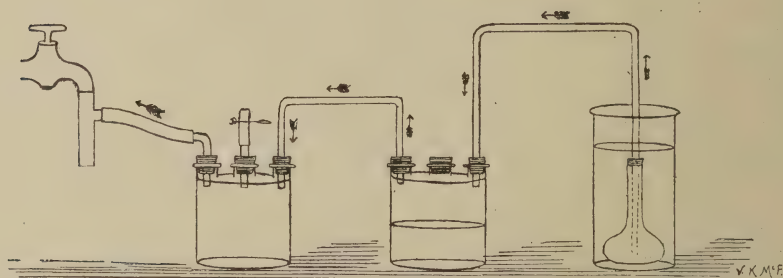
I make it a point to test every flask for purity (microscopically) before preparing the toxin for use. If the flask be pure, the exact quantity of culture which it contains is measured, and either five-tenths per cent. of phenol or four-tenths per cent. of trikresol added to kill the bacilli and insure the material from contamination. I have found trikresol preferable to phenol.

The toxin thus prepared is ready for use, and is the same as that employed in the experiments of Ehrlich, Behring, Wassermann, Kossel, Boer, and Aronson.

I have used toxin in this condition upon a number of horses, but in two cases have noted that which Kinyoun points out, that the dead bodies of the bacilli possess irritating properties, and sometimes set up a local inflammation terminating in suppuration. Lesions of this kind, with distinct abscess-formation, occurred after each injection in one horse. The discharged pus was sterile.

This local irritation can, as Behring has pointed out, be overcome by the addition to the toxin of trichloride of iodine or, as Roux prefers, of Gram's solution, but the best means of avoiding it is to filter the toxin through a porcelain filter before employing it. The filtration should not be done too long before using the toxin, as it is said to deteriorate more rapidly afterwards than before. (See Fig. 2.)

FIG. 2.



Author's method of filtering the toxin.

Toxin prepared as described should be of sufficient strength for one-tenth cubic centimetre to kill a five-hundred-gramme guinea-pig in twenty-four hours (Roux). Very few observers seem to have secured exactly this strength, and I must confess that the best I have done is to secure it sufficiently strong for one-tenth cubic centimetre to kill in thirty hours.

There seems to be a rather exaggerated idea of the value of air currents in connection with toxin production. I have succeeded in producing a toxin as strong as that mentioned above in a one-hundred cubic centimetre Erlenmeyer flask under most ordinary conditions. Ohlmacher sees no difference in the toxins from ordinary and special flasks, and, though I believe they have not mentioned it in print, Professor Prudden and Dr. Abbott have both informed me that in their opinion special flasks were of no very particular value. However, I have had fewer failures with the modified Fernbach than with the ordinary Erlenmeyer flasks, and continue to use them.

The antitoxin is produced by the increasing injection of this toxin into a partially immune animal, as has been described. The animal ordinarily employed is the horse,—not because the horse will furnish either the strongest antitoxin or because the horse is most easily handled, but because, while it will produce good antitoxin and do it rather easily, it will also furnish an enormous amount of the serum. Behring in his experiments used a great variety of animals. Aronson used the goat. Roux introduced the horse. The first animal upon which I experimented was a goat, furnished through the liberality of Professor John Guit  ras, to whom my sincere thanks are due for much personal kindness in the pursuit of my antitoxic studies.

The horses which we buy are strong horses of middle age with some unsoundness which disables them from active physical service. We never employ any with an organic disease. Each one is tested by Dr. Pearson for tuberculosis and glanders, and so far we have been fortunate in having had but one to react to mallein. This horse was, of course, rejected.

The general *regimen* of the animals is well cared for; they are well fed, are cleanly kept, the temperature and pulse are taken several times daily, and they are weighed once a week. Every day those whose condition permits are taken out for exercise.

The injections begin with one cubic centimetre of strong toxin, and the greatest variation in susceptibility soon manifests itself as the doses increase. The treatment of a horse of marked susceptibility requires care, judgment, and avoidance of haste. Immune horses may be immunized rapidly, dose after dose being given before slight indisposition to eat or fever shows a slight effect from the toxin.

The injections are made in two ways, varying according to the size of the dose of toxin to be given.

In the beginning, the dose being small, a burette with a fine rubber tube, connecting with a needle below and an atomizer-bulb above, is used. With the gentle elastic pressure of this bulb a very exact estimation of the force exerted can be made, and the exact quantity can easily be given.

The injections are generally made in the subcutaneous tissue of the neck, though any other point where the skin is loose will answer as well.

The large amounts are allowed to flow in slowly by gravitation. I think that the care with which the injections are given bears a distinct re-

lation to the severity of the after-effects. My horses show much less swelling than others that I have seen.

A general outline of the injections for an average horse would be as follows :

Week.	Cubic centimetres.	Week.	Cubic centimetres.
First	1	Seventh	100
Second	2	Eighth	150
Third	5	Ninth	200
Fourth	10	Tenth	250
Fifth	25	Eleventh.....	250
Sixth	50	Twelfth.....	300

After receiving the three hundred cubic centimetres of strong toxin the blood generally contains considerable useful antitoxin.

The immediate effect of the injections as observed in my animals is only of importance in susceptible animals or after large doses. Under these circumstances the temperature begins to rise, ascending from the normal (about 101° F.) to 103°–105° F. The pulse is slightly accelerated, the animal develops œdema at the point of inoculation, and shrinks from the pressure of the finger. The swollen area is hot. The appetite diminishes, so that only one-half or one-quarter of the next meal is eaten. After this the animal appears better, and by the second or third day the symptoms ameliorate, the swelling rapidly diminishes, and the animal seems as well as ever.

Kinyoun points out the interesting fact that when the horse is receiving one hundred to two hundred cubic centimetres of toxin one would naturally expect to find some antitoxin in the blood, but on testing is surprised to find it absent. It seems only to develop after the large doses, which is exactly what we would expect from what Ehrlich has taught us about ricin.

About four days after the horse receives his final well-borne dose of three hundred cubic centimetres of toxin a slight incision is made into the skin over a compressed jugular vein, and a trocar plunged in. As the trocar is withdrawn, a canula plug, attached to a rubber tube, is introduced, and the blood, to the amount of six or seven litres, withdrawn into sterile bottles. Roux uses ordinary wide-mouth bottles, the tops of which are covered with paper, and protected by paper caps before sterilization. When one is to be used its cap is removed, and a glass tube in the end of the rubber tube plunged through the paper, so that the interior of the bottle is never exposed. When full, the tube is withdrawn and the cap replaced. I have used this method and greatly prefer it to anything else that I have tried.

The blood is stood away in a refrigerator as soon as coagulation occurs, and the serum may be pipetted off on a number of subsequent days. When the trocar is withdrawn from the neck of the horse the wound is closed by a pin suture, and always heals kindly in a short time.

The serum, as pipetted off, is slightly clouded, and is best stood aside

for a while longer, with a piece of camphor floating upon it, in tall glass cylinders of about three hundred cubic centimetres capacity. The corpuscles then precipitate and the clearness is improved.

There are a variety of methods of preserving the antitoxic serum. Roux prefers a piece of camphor, Behring phenol (0.5 per cent.). I prefer four-tenths per cent. of trikresol.

The estimation of the protective value of the antitoxic serum is of great importance. Unfortunately it consumes much time and a considerable number of guinea-pigs.

There is no absolute standard of strength, and the serums made by Behring, Aronson, and Roux all differ considerably. Roux does not give the strength of his, but states as the dose a considerable quantity, so that compared, for example, to Aronson's, it is comparatively weak. Behring furnishes three varieties: No. 1, weak, useful for immunization; No. 2, strong, useful for treatment; and No. 3, very strong, but not very highly recommended.

Behring gives an exact measurement of his serum, which is not only useful but exemplary, for without it an exact estimation of the dosage is impossible.

The unit of strength given by Behring is what he terms the "immunity unit." It is an amount of antitoxic serum required to protect a standard guinea-pig (500 grammes) against ten times the minimum fatal dose of diphtheria toxin. Thus, if by experiment it is proved that one-hundredth cubic centimetre of the antitoxic serum when mixed with the one-tenth cubic centimetre of toxin which constitutes the ordinary fatal dose, and injected into a healthy guinea-pig of five hundred grammes weight, will cause the animal to recover from the effects of the poison, it is obvious that one cubic centimetre of the antitoxic serum contains one hundred immunity units, and would save one hundred guinea-pigs, that ten cubic centimetres would contain one thousand immunity units, and would save one thousand guinea-pigs, and so on.

The advantage of this system of denomination is that the estimation of the dose is simple. The standard guinea-pig weighs one pound. If the serum have a strength of one hundred immunity units per cubic centimetre, one cubic centimetre of it should protect one hundred pounds of animal, and will do so if the animal to be protected be a guinea-pig. Unfortunately, animals vary greatly in susceptibility to diphtheria, and experimentation has shown that guinea-pigs are ten times as susceptible as men both to the toxin and to the antitoxin, and that, in proportion to the body weight, ten times as much must be given a member of the human species as would be given to a guinea-pig.

It will be of interest to observe the charts of some of the animals which have been subjected to the toxin injections:

I. This was a large goat, subjected to injections of Behring's toxin. The animal was covered with long hair, and atrophied very much before

the condition was detected. The temperature reaction was very great after each injection, showing that the dose was out of all proportion. The animal suddenly died in the ninth week of treatment,—not without cause.

II. This was one of the horses to which I referred as showing suppuration after the injections of unfiltered cultures. The animal was remarkably susceptible, and died, after five cubic centimetres of phenolized culture, with all the signs of profound toxæmia observed ordinarily in guinea-pigs.

III. Another susceptible horse which seemed to be doing well, though the temperature reactions were marked. One day he abruptly fell dead

CHART III.

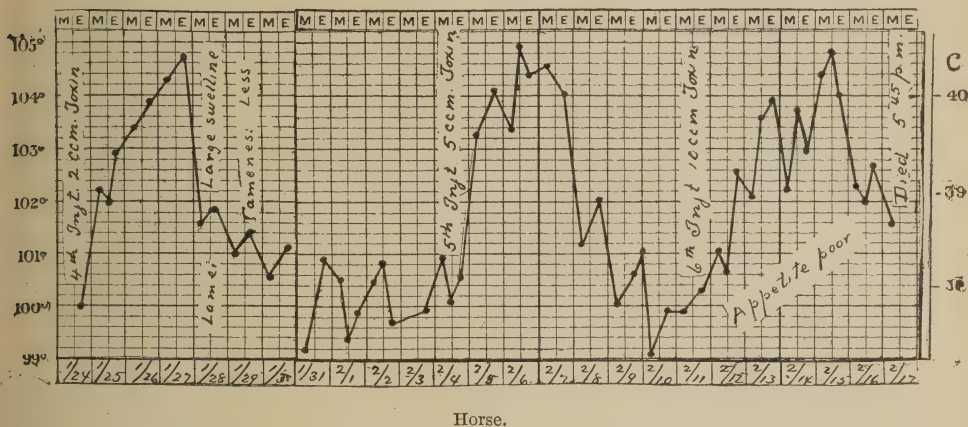
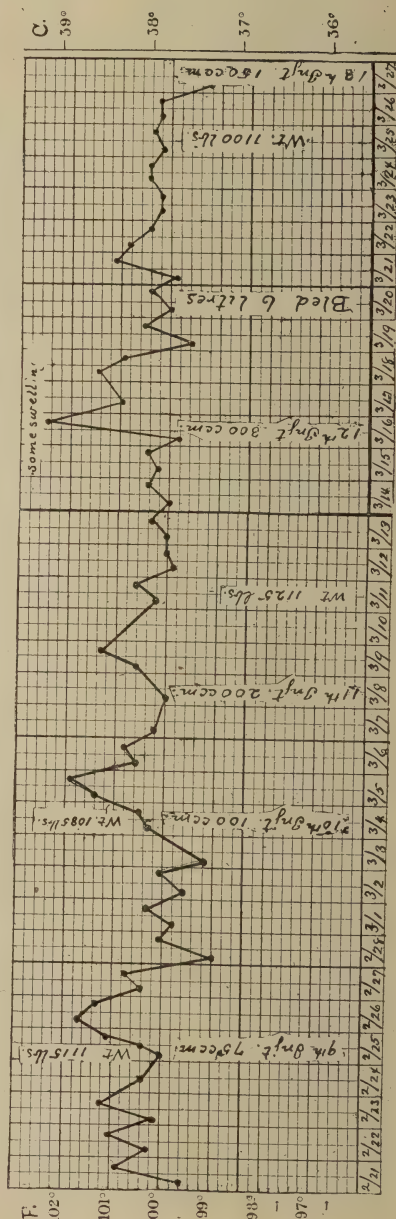
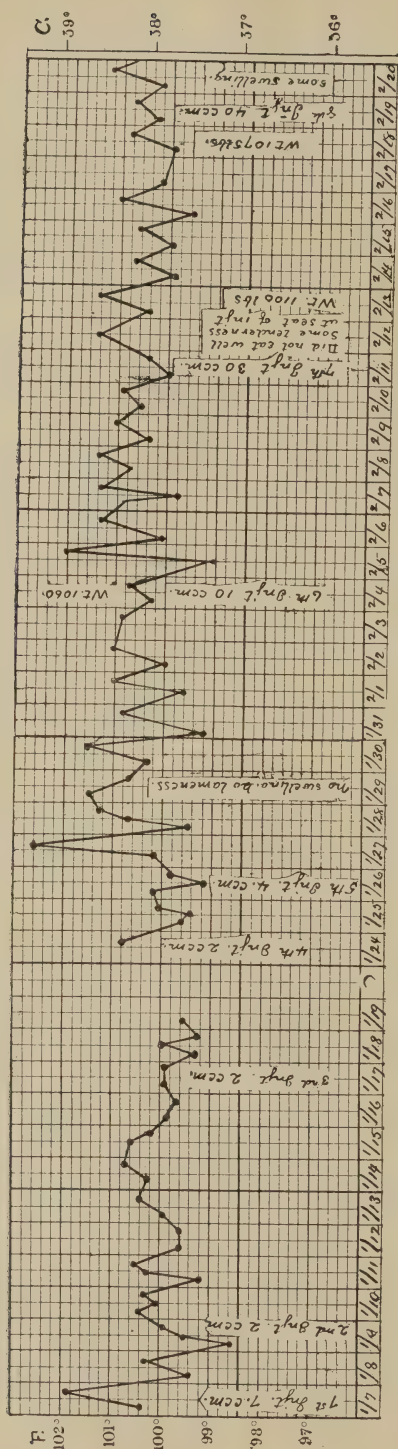


CHART IV.



Bay gelding.

THE RESPIRATORY SYSTEM.

REMARKS BY J. P. CROZER GRIFFITH, M.D.

Whether diphtheria is primarily a general systemic disease with local manifestation, or whether it is a local process with a secondary toxic systemic infection, is a question which has been much disputed and not even yet settled. Analogy to other infectious processes would certainly indicate that the former view is correct. So also the cases which have been reported, during epidemics of the disease, in which the general symptoms were present yet without any local manifestations, tend to uphold this opinion. On the other hand, the second view is supported, among many other reasons, by the fact that sore throats of different sorts are so prone to be attended by decided constitutional impression and by the fact that, as in pneumonia, more than one microbe appears to be able to produce a pseudomembrane in the throat, with swelling of the glands and prostration. Which of the views is correct we cannot pretend to determine.

The pharynx is not, properly speaking, a part of the respiratory apparatus. At the same time it clearly falls to me to discuss the pathology of the disease as related to this part of the body, as well as to the respiratory apparatus, since it has been assigned to no one else. The gross appearances of the diphtheritic exudate in the pharynx are by no means entirely characteristic. If we examine the throat early in a case of diphtheria we may find a small amount of gray-white or yellow-white deposit upon one or both tonsils. To pronounce this to be diphtheria is by no means a safe thing to do, apart from the bacteriological examination of the membrane. In the first place, it may resemble closely the appearance of follicular tonsillitis. It is perfectly possible, as bacteriological studies have shown, for a diphtheria to start in the tonsillar crypts and to confine itself to them, never extending to other parts of the throat. Cases occur frequently which carry conviction regarding the truth of this statement, even though no bacteriologic study be made to confirm it. I have more than once seen house epidemics of diphtheria in which certain cases, undoubtedly diphtheritic from the association with graver cases and from the existence of constitutional symptoms, exhibited only one or two follicles filled with the white secretion. These cases would certainly have been pronounced lacunar tonsillitis if seen alone. Such an experience as this is of every-day occurrence. Then, again, it is possible for the deposit of lacunar tonsillitis to spread beyond the follicles and to produce a membrane by the fusion of the secretion from different follicles. As a rule, however, the appearance in such cases differs from that in diphtheria. In the latter disease the membrane is rather tougher, and adheres more firmly to the mucous membrane of the pharynx and tonsils, so that efforts at its removal are apt to cause blood to appear. The false membrane is, in fact, not *on* the mucous membrane, but *in* it,—i.e.,

the natural lining of the throat becomes necrotic and forms a part of the so-called deposit. As time goes on the membrane of diphtheria shows its real nature by its tendency to spread to other parts of the throat, especially the uvula and the pillars of the pharynx. This is, perhaps, one of the safest clinical tests for the recognition of diphtheria as distinguished from tonsillitis, although the absence of this spreading is, as stated, not positive proof that the disease is not diphtheria. Apart from lacunar tonsillitis, there are other conditions which simulate diphtheria very closely. In the eruptive fevers, and especially in scarlet fever, we may have a pseudo-membrane produced which is entirely indistinguishable from that in diphtheria. It not only appears like it, but, like it, need not limit itself to the tonsils. There is, in fact, no gross or fine pathological character, apart from its bacteriological nature, which serves to distinguish it. So, too, false membrane may be produced by corrosive substances. There are also various forms of pharyngitis, called ulcerous, pultaceous, aphthous, herpetic, etc., in which a form of pseudo-membrane develops, and which may in some instances be confounded with diphtheria. In some there are one or more small, shallow ulcers, with a thin, grayish membrane covering them, but the thick and extensive membrane of diphtheria is absent. In others there is a soft pultaceous substance in the pharynx, which can be removed easily without injury to the mucous membrane beneath. I have seen some cases, however, in which the diagnosis was extremely difficult or impossible. In fact, there seems to be a large number of cases in which a pseudo-membrane forms which cannot be distinguished from that of true diphtheria, and which may exhibit the same tendency to spread. In most of these cases the deposit is clearly of microbic origin, although some coccus, and not the Klebs-Löffler bacillus, is the active agent. The condition is variously described as pseudo-diphtheria, diphtheroid, streptococcus diphtheria, etc. Like true diphtheria, it is capable of extending to the larynx.

The appearance of the pseudo-membrane in thoroughly well-developed cases of diphtheria is well known. It is usually very extensive, and covers the tonsils, pillars of the pharynx, uvula, posterior pharynx wall, and epiglottis, and may extend to the lining of the cheeks and even to the skin outside of the mouth. Involvement of the nose is of very common occurrence. The exudate is at first grayish-white, but as it grows thicker it becomes darker or more yellowish and opaque. After four or five or more days in favorable cases it begins to disappear, sometimes slowly melting away and sometimes being cast off in distinct pieces. The length of time during which traces of the membrane may remain seems to bear no direct ratio to the amount originally present. I have seen small grayish patches persist almost unchanged for days during convalescence in cases in which the symptoms had been very slight and there had been but little membrane, while in other very grave cases with extensive membrane the rapidity of clearing up was sometimes remarkable.

In severe cases the membrane, instead of disappearing, shows a constant

tendency to spread, both in superficial extent and in depth. Sometimes extensive necrosis takes place. A vessel may be eroded or, as in a recent case under my observation, subcutaneous emphysema of the neck and upper part of the thorax may occur.

One of the most common and dangerous methods of extension is to the larynx. It is, however, not especially in the cases of very extensive pharyngeal involvement that the laryngeal complication is most apt to take place. Just as frequently there may be very little to be seen in the pharynx during the course of the attack. In one case, for instance, which I saw some time ago, membrane was seen upon the tonsil on the first day of observation, but this had disappeared by the next day, although marked laryngeal symptoms had developed which rendered tracheotomy necessary a short time later. There is reason to believe that such an occurrence as this is very frequent.

In this connection we pause a moment to consider briefly the pathology of diphtheritic laryngitis and its relation to the so-called group. The case to which I have just referred illustrates how easily mistakes may and do occur. Such a case might very readily have been considered one of primary laryngeal diphtheria except for the observation made at the first visit. It frequently happens that at autopsies of cases which seemed to have been purely laryngeal, and in which no membrane elsewhere could be detected at any time, some membrane is found in situations in the pharynx which were invisible during life. Primary laryngeal diphtheria is certainly comparatively uncommon. The use of the term "croup," as indicating a pseudo-membranous laryngitis which is not diphtheritic in nature, is most misleading and erroneous. While it is probably perfectly possible that a pseudo-membranous laryngitis may develop which is purely inflammatory in nature, not dependent upon microbic action, such an occurrence is certainly, in my opinion, of great rarity. There are no characteristic symptoms which would indicate that this had occurred, and which would serve to distinguish such an affection from a laryngeal diphtheria. In a recent case dying in the Children's Hospital of this city with the symptoms of croup as described in earlier text-books, a pseudo-membrane, limited to the larynx, was found, but later study showed this to contain the Klebs-Löffler bacillus. Certainly the great majority of cases of laryngitis of this sort are true diphtheria. At the same time, it has been proved of late years that many cases of laryngeal membrane, although microbic, do not exhibit the diphtheritic bacillus. This is true, for instance, of the cases of streptococcus diphtheria whether the process spreads from the pharynx to the larynx or was primary in the latter locality.

The pseudo-membrane of diphtheria may spread downward below the larynx even into the lungs. In both larynx and trachea it is not as firmly attached as in the pharynx, and may be more easily stripped off.

The severity of the symptoms of laryngeal stenosis does not necessarily depend upon the amount of membrane present in the larynx. As a rule, the deposit on the cords is thin. I have repeatedly been struck by the

fact that the condition of the larynx, as seen at the autopsy, did not seem to account for the death from laryngeal stenosis, very little membrane being visible.

Having run over briefly, as the time requires, some of the gross pathological characteristics of the lesions of the pharynx and larynx in diphtheria and their bearing upon symptoms and diagnosis, I must consider for a moment the histological changes to be found. There is, at first, hyperæmia of the mucous membrane, followed in a very short time by the production of the pseudo-membrane. This latter consists of epithelial cells which have been killed by the action of the poison, and have then undergone hyaline transformation. Leucocytes pass through the blood-vessel walls under the influence of the inflammation, and then they too die and undergo the same hyaline transformation. The pseudo-membrane is thus made up of dead, altered cells with, of course, numerous bacteria, chiefly the diphtheria bacillus. On the surface of the pseudo-membrane these bacilli are associated with other micro-organisms, especially cocci, while in the deeper parts there are few microbes of any kind.

There remains still to consider the condition of the lungs in diphtheria. Involvement of these organs is a quite frequent complication. At the autopsy we may find the membrane extending into the small bronchi. There are often atelectatic areas, œdema, bronchitis, and, especially, bronchopneumonia. The latter is most apt to develop in the first week of the diphtheritic process. It is in many cases simply an extension of this process from the trachea; in others it may be of a septic nature. Various micro-organisms, including the diphtheria bacillus, have been found in the pneumonic lungs. Whether tracheotomy increases the liability to the development of pneumonia is a disputed point.

GLANDULAR AND CIRCULATORY SYSTEMS.

REMARKS BY W. E. HUGHES, M.D.

In considering the circulatory and glandular systems, the part of this discussion which has been assigned to me, I have thought that it will be more valuable if my remarks be based rather upon the clinical than upon purely pathological questions. Of these two systems the circulatory is much the most important clinically, seeing that many of the deaths in diphtheria are directly due to cardiac causes. Too much stress cannot be laid upon this. Death may take place through heart-failure in one of two ways,—either the nervous supply of the heart is seriously interfered with, or there has been a profound degeneration of the muscular fibres. Often, doubtless, when neither one of these causes alone would be serious, their combination would be fatal. It is always to be clearly borne in mind that

the effects of diphtheria on either the circulatory or the glandular apparatus are due, not to the bacilli themselves, but to their toxin, and, more, that in many—nay, most—cases of diphtheria there are associated with the pathogenic bacillus various cocci, which have themselves deleterious effects, and in many ways modify the effects of the bacillus. Sudden death in diphtheria may occur at any time after the disease has reached its height. When it is due to nerve involvement it will be, as a rule, late, generally after convalescence has been well established. The heart-muscle here may, on examination, be found to be practically normal, nor is it necessary that there have been any distinct signs during life, previous to the sudden fatal ending, of cardiac weakness. As a rule, however, suspicions may be aroused by causeless palpitation or irregularity of the pulse. It is scarcely necessary to point out here that the apparent virulence of the diphtheria has little to do with its ultimate toxic effects. Probably, through individual susceptibility, the mildest cases may have the most unfortunate terminations.

The commoner form of sudden death is brought about by degeneration of the heart-muscle. In all specific fever there is a certain amount of toxic muscular degeneration, but in no other is this so prominent as in the one under consideration. This degeneration begins with establishment of prominent systemic symptoms, and reaches its acme about the time of the beginning of convalescence. Deaths, then, are to be looked for comparatively early. Macroscopically, such a heart has its cavities dilated, its walls flabby and of a dead-leaf color, as in a case which I had the honor of presenting to this Society a few meetings back, when death had occurred within a week of the onset of diphtheria. Microscopically, the change has been well enough studied to make us believe that there is nothing peculiar in the degeneration. Individual fibres are attacked with varying intensity at different points, the process going on even to a coagulation necrosis. Clinically such a heart will present the usual signs of acute dilatation, especially on the right side. There will be altered areas of dulness, altered sounds and force, and the sphygmograph will show characteristic failing heart-power, together with loss of elasticity in the arterial walls.

Endocarditis and pericarditis are probably never found associated with pure diphtheria. When they do occur their exciting cause is some of the various associated cocci.

Outside of the heart the vascular apparatus generally is affected. A wide-spread degeneration of the arteries, and even more of the capillaries, is found. This leads to a symptom very frequently associated with diphtheria,—hemorrhage; and this may be a cause of sudden death through bursting of a vessel at a vital point.

The glandular system shows early and marked effects of the toxin. The first to be involved are the lymph-glands, and primarily those nearest the seat of local infection. The microscopic lesion here is an accumulation of lymph-cells, probably an example of phagocytosis, and to be associated

with the leucocytosis so constantly occurring in diphtheria. When there is necrosis of the lymph-glands the cause is a coccus, and not the pathogenic bacillus. The salivary glands, and even the glands along the gastro-intestinal tract, show a degeneration of their epithelium, but not to a degree capable of producing prominent symptoms.

Though almost all pronounced cases have a certain amount of albuminuria, yet this is, as a rule, significant of no pronounced renal lesion, but due merely to the trifling degeneration of kidney epithelium common to all the specific fevers. In exceptional cases the lesion has progressed further, the epithelium is extensively involved, possibly even to the point of coagulation necrosis. The lesion is practically the same as that produced by Dr. Carter and myself in our experiments with uræmic serum, and is unquestionably the direct result of the local action of the toxin. Rarely is there degeneration of the Malpighian tufts, and never to the extent seen in the glomerulo-nephritis of scarlet fever. When the tufts are so involved it is probably the result of the general involvement of the circulatory apparatus rather than of any local process going on in the kidney. Clinically, the kidney involvement is of little importance unless it proves immediately fatal, as it will, as a rule, be recovered from and not lead to any chronic disease.

In the liver the effect is produced rather upon the interstitial tissue than upon the acinal cells. Though these cells are fatty, yet there is scarcely an actual degeneration. This condition of the liver suggests strongly the results of Dr. Flexner's experiments with abrine. It would suggest further that in diphtheria we may possibly find the starting-point of some cases of cirrhosis of this organ.

THE NOSE, EAR, AND EYE.

REMARKS BY B. A. RANDALL, M.D.,

Clinical Professor of Diseases of the Ear at the University of Pennsylvania.

The occurrence of diphtheritic rhinitis is not among the frequent appearances of diphtheria; still less common are clearly-defined clinical cases of the disease in the ear or eye. However, the number of cases is probably much greater than is commonly supposed, and further bacteriological investigation in this matter will make these cases more frequently recognized in the future. But it may be fairly stated that diphtheritic rhinitis, as a separate entity, is a condition that is exceedingly rare. No individual worker in the laboratory has gotten together more than a dozen *proved* cases as his contribution to the literature of the subject, and I know of no clinicians who have had more. Cases of croupous inflammation will come, as Dr. Griffith has said, to materially swell the number of those *suspected*; but bacteriological examination alone can settle the question. The cases that are clinically diphtheritic rhinitis are decided rarities, and will probably

so remain ; yet the presence without any symptoms of the diphtheria bacillus in the nose, as in any part of the body, will probably be more and more frequently shown as examinations are more systematically made. The lesion in the nose is but slightly inclined to extend, and it is commonly confined largely or wholly to one side. Stenosis is generally more or less marked, and is due partly to swelling, as well as to the thick, pultaceous and rather adherent membrane. The characteristic bleeding on detaching it may be found also in many cases of a strictly croupous condition, such as cauterization or a foreign body may give rise to.

Upon the conjunctiva the condition is one of rather extreme rarity, while the croupous formations here are very common, being found in almost every case of purulent inflammation, especially the gonorrhœal. But the rare cases where diphtheria occurs strike the oculist almost immediately, and may be recognized long before he has made a close examination of the case. The puffing lids of the ordinary suppuration are almost lacking. The condition may seem one of anæmia, although the bleeding which often follows rough manipulation of the membrane or of the excoriations of the lids is commonly marked. With the nose, and particularly with the conjunctiva, the necrotic character of the process is a serious element. Even in non-diphtheritic cases the cornea is apt to suffer ; and almost always it sloughs in cases of true diphtheria : yet the number of authentic observations is really rather too small for any sweeping conclusions. I have certainly seen two—perhaps three—cases among the ten thousand of my patients, and an equal number of those of others.

In inflammations of the external ear we frequently have false membrane, but it may or it may not be diphtheritic. When there is diphtheria constitutionally present, and manifested locally elsewhere, we may yet find no trace of the bacillus in the false membrane of the ear. This generally forms on surfaces already excoriated, or at least inflamed, as in the nose. On the other hand, as in a case recently seen in my friend Dr. Cohen's practice, there may be no pseudo-membrane in the ear and only a little in the fauces, which showed absolutely no trace of diphtheritic bacilli in the cultures. But it was almost accidentally found that there was quite a virulent culture of the bacillus obtainable from the ear discharge. Clinically, this may be wholly unimportant in the ear, the case going on to rapid and uneventful cure. Ordinarily, the attack of the disease upon the tympanum is accompanied by the streptococcus, and there is apt to be a very destructive process, destroying the drum-head and ossicles, attacking the labyrinth-wall, and penetrating, at times, to the brain with fatal results. This brief statement presents these local aspects in about as full a way as I feel is necessary on this occasion.

THE NERVOUS SYMPTOMS AND LESIONS OF DIPHTHERIA.

REMARKS BY CHARLES W. BURR, M.D.,

Clinical Professor of Nervous Diseases in the Medico-Chirurgical College.

The time at our command is so limited, and the hour so late, that I will omit all references to authorities. To understand properly the mechanics of the nervous symptoms of diphtheria—that is, what organs are affected and in what way—we must first consider the symptoms, for all nervous manifestations occurring in diphtheria are not necessarily diphtheritic.

The most common and most important symptom is paralysis of a peculiar and characteristic type. It is most apt to appear during convalescence, or, indeed, weeks after recovery from the acute disease. It usually affects first, and often alone, the palate and the accommodative apparatus of the eye. The onset is slow and the march irregular, parts far distant from each other being attacked in succession. The knee-jerk is abolished (sometimes very early in the disease), even though there is no leg palsy, or even if there is no palsy at all. There is moderate wasting. The electrical reactions of the affected muscles vary greatly; often there is faradic diminution, much less frequently reaction of degeneration. The tendency is towards recovery.

The sudden hemiplegia which sometimes occurs is, properly speaking, not diphtheritic, but is due to the same causes which produce hemiplegia in other acute infectious fevers,—viz., arterial rupture, embolism, or thrombosis. Rarely there occurs a hemiplegia which, early in its course, mimics a peripheral palsy, and later shows all the signs of a cerebral origin. Thus, A. F., aged five years, came to the Infirmary for Nervous Diseases with the following history: He had diphtheria in May, 1890. During the acute stage there was palatal palsy, with nasal voice and difficulty in swallowing. Some time after, during convalescence, the left arm and leg rapidly grew weak, and finally became entirely paralyzed. On examination in July, 1890, he could swallow well; sat up with difficulty, the head falling forward on the chest and the back-muscles being very weak. At the same time there was absolute flaccid palsy of the left arm and leg, and partial palsy of the left face. There was general emaciation, but no distinct local atrophy. The knee-jerk was absent on both sides. The plantar reflex was present. There was incontinence of urine and marked constipation. At the first examination there was faradic reduction, but at no time reaction of degeneration. When seen last, four years after the onset, the character of the hemiplegia had entirely changed. Instead of being flaccid, with absent knee-jerks, there was a spastic paralysis of the left side, with marked increase of the reflexes,—a perfect picture of a cerebral palsy. Complex as this case appears at first sight, the explanation seems to me simple. I regard it as most probable that there was a true but slight general diphtheritic palsy; that later a vascular cerebral lesion occurred, the signs of

which were for the time masked by the previous palsy, and that as the latter passed away the cerebral signs came to the front.

The extent to which diphtheritic paralysis may spread is well shown by the following case, also from the Infirmary: A. C., twenty-two years old, laborer; April, 1894, mild diphtheria. During the acute stage regurgitation of liquids through the nose. During convalescence, and after he had been out of bed some time, there appeared a gradually-increasing weakness of the arms and legs, until finally he was bedridden and could not feed himself. There was never muscular nerve-pain, relaxation of the sphincters, nor anæsthesia. There was marked general emaciation. Faradic muscular reaction was somewhat reduced. The knee-jerks were abolished. When he recovered sufficiently to walk there was marked steppage-gait. After several months recovery was complete.

Much less attention has been paid to ataxia in diphtheria. Slight ataxia and choreiform and ataxiform movements are not uncommon in cases of palsy; but more than this, the ataxia may be the predominant symptom, as in the following case from my service at the Medico-Chirurgical Hospital: L. B., five years old, had diphtheria in October, 1894. No palatal palsy. During convalescence, and after he had been out of bed some days, his father noticed that he at times walked as if drunk. On examination his gait was markedly staggering. There was greater ataxia on movement of the hands. Station was very bad with eyes closed; with eyes open, better, but still bad. The muscles supporting the head were paretic, so that it was held up with difficulty. There was no palsy of the arms or legs. The knee-jerk, the biceps-tendon jerk, and the chin-jerk were absent. The muscle-jerks in the forearms and the cremasteric jerks were present. The pupils were equal and reacted well to light, and with accommodation. Sensation was perfect. Complete recovery was established in four months. Besides the palsies noted above, there occurs sometimes a rapid paralysis of one cranial nerve, or, again, some time after the acute disease, a slow degeneration of a cranial nerve may take place. Concerning the heart palsies, which are a so frequent cause of sudden death, Dr. Hughes has spoken. The sensory symptoms are less patent than the paralytic and ataxic. There are often pharyngeal anæsthesia and curious patches of anæsthesia distributed in various parts,—for example, the finger-tips. Pain and touch may both be involved, or touch alone.

Given the above data, the question before us is to discover the seat or seats of the nervous lesion and its nature. Many autopsies have been made and not infrequently have been fruitless. The earliest view held was that there was inflammation of the palatal nerves, which, ascending to the cord, produced disease in it which, in turn, caused all the symptoms. Advance in knowledge of the physiology of the nervous system has caused this theory—that is, that the cord is always at fault—to be abandoned. Reasoning backward from the symptoms, we should expect to find the seat of trouble in the peripheral-nerve trunks; and actually the most frequent lesion found

has been a parenchymatous degeneration of the nerve-fibres. But why is there sometimes no lesion at all? We must accept the view that the primary cause of the symptoms is a poison or poisons produced during the life of the diphtheria bacillus. Now it is well known that toxic substances may cause alteration or abolition of function without visible lesion, and that when lesions are produced they are the products rather than the cause of the disturbance. It is probable that in the future micro-chemistry will give us reactions that will make chemical changes in the composition of the nervous system visible. The very fact of the tendency of nervous diphtheritic troubles towards recovery makes it still more probable that usually there is no organic change.

A very remarkable fact in diphtheritic palsy is that in certain undoubted epidemics palsy has occurred without any evidence of a preceding diphtheria, which seems to prove that there is a distinct palsy-producing poison. Again, Martin has found an albumose in the blood which, injected into rabbits, causes palsy. The whole question, however, of what the poison is and how it acts falls rather within the domain of Dr. Abbott.

Finally, in some instances there is no nervous disturbance at all, but the palsy is due entirely to a degeneration of the muscles themselves.

CLINICAL LECTURES.

PLASTIC OPERATION FOR DENUDATION OF THE SCROTUM AND GENITALS. CALCULUS; PYELONEPHRITIS.

CLINICAL LECTURE DELIVERED AT THE BUFFALO GENERAL HOSPITAL.

BY ROSWELL PARK, A.M., M.D.,

Professor of Surgery, University of Buffalo.

GENTLEMEN,—Our patient to-day is a young man who, some weeks ago, suffered an unusually distressing accident. He was employed in a planing- and sawing-mill, and while engaged in his work he straddled a revolving beam, on which was a projecting cam, a bolt of which caught in his overalls, drew him down still closer to the shaft, and tore the scrotum almost entirely off, taking with it, also, all of the covering of the penis except a little tissue which remained adherent to the *corona glandis*. He has recovered from the shock of the accident, and the denuded area is beginning to be overgrown with healthy granulations. We must remember, however, that the resulting scar will produce contractions and distort

the parts. I purpose, therefore, covering the denuded area with flaps taken from the inner side of the thighs. Not only the apparent field of operation has been shaved and scrubbed, but the surrounding parts also, going down the thighs almost to the knees, as it is impossible to foretell just what part will be utilized in the plastic work. The raw surface of the penis and scrotum is scrubbed with soap, for the purpose of removing the granulations, for no flap would adhere to such a granulating surface. The right testicle, which is pendulous and exposed, I shall remove. The left, which is retracted almost to the external ring, will be left *in situ*. I find that even after the vigorous scrubbing there are granulations remaining that are so superficial and whose nourishment is, therefore, so slight that I should be disappointed in the adhesion of the skin-flaps if they were allowed to remain. I shall use the curette to remove all the tissues down to the smooth fascial layer. This preliminary to the operation illustrates the treatment of irritable ulcers, of which I recently spoke to you in the didactic course.

The right spermatic cord is ligated firmly with catgut and cut. On account of the hyperplasia of the tissues about the corona glandis, there is a large amount of retained smegma which it is unnecessary to remove. I am trying now to see if I can utilize what is left of the prepuce. If I had known beforehand just what I was going to do, I should have outlined the operation to you, but in plastic surgery such a method is rarely available; the surgeon must usually undertake the operation with no matured plan, but ready to avail himself of every natural advantage, and to cut his flaps according to the amount of skin at his disposal. I have succeeded in loosening a cuff of preputial tissue from around the distal end of the corpus spongiosum.

The left testicle, being so far retracted, will be in the way, so I shall extend the incision upward into the groin, so as to bury the testicle above the pubes. The hemorrhage from the freshened surface will now be checked with the antipyrin spray. You will notice that the atomizer, which is full of a hydronaphthol solution, is disinfected before using, and that the metal tip, when not in use, is kept permanently in a glass bucket that hangs above the operating-table. Through this oblique incision over the course of the spermatic cord I shall pull the testicle upward and transplant it into the abdominal cavity, where it will be out of the way. The remainder of the operation is very much simplified by this disposition of the testicle. I shall have a detailed and explicit account of the operation made in the hospital records for the sake of protection. Ten years from now this man might want to be married, and he might imagine that he was disqualified from having no testicle apparent. Some shyster lawyer might put it into his head to sue me for damages.

There is one thing that must never be lost sight of in plastic surgery, and that is that a flap removed from its natural location will retract fully a third. A horseshoe flap is cut from the anterior surface of the right

thigh. Even this is not as large as I should like, but if I attempted to cut it larger I should defeat my own object by not allowing sufficient connection with its parent tissue to provide for nutrition. This flap is about ten centimetres laterally and fifteen longitudinally in diameter. For transplanting we want merely skin and as little other tissue as possible. This flap is sutured to the stump of prepuce still adherent about the corona glandis. The skin is, fortunately, so elastic that the gaping wound on the thigh can be drawn together quite easily. The same flap is brought together around the penis and sutured along the line of the urethra. We have now covered the entire dorsal surface of the penis and the distal half of the entire circumference. There remains the denuded perineum and the posterior half of the under surface of the penis.

I will first draw together the gaping wound on the right thigh, dissecting back a skin flap on each side, so that the two flaps can be brought together in the middle. They are united to each other by a continuous catgut suture. This still leaves a gaping wound in the right groin; if I sew it, I am afraid that there will be too much tension, and that I shall fail to get union. I shall, therefore, make another incision, approximately at right angles with the first one.

The skin of the left thigh is now shaved and disinfected beyond the original limits, to provide for a second flap, triangular in shape, taken from the upper part of the left thigh and groin. The apertures from which the flap was taken are now closed up, the flap having been slid around to cover the perineum and lower surface of the penis. Although the result of the operation is not a thing of beauty, it will, I hope, prove a joy forever to the unfortunate young man.

[NOTE.—An examination of the testicle by Dr. A. L. Benedict showed that it was in a state of cloudy swelling. The expressed fluid contained no spermatozoa, and teemed with bacteria, mostly cocci.]

CALCULUS; PYELONEPHRITIS.

This patient was in the hospital eighteen months ago, and he was re-admitted two weeks ago. The record at the time of his first visit to the hospital is as follows: "Good family history; well up to seven years ago. At that time he received an injury to his back, and was quite sick for two months. After this he was troubled with frequent micturition and distress referred to the bladder. Four years ago had pain over the left kidney, and a swelling appeared in the left groin. Was treated with electricity for some paralysis of the bladder, and was somewhat relieved by an operation for stricture. Has frequently had attacks of gravel. Two years ago his lumbar region was opened, and a quantity of pus evacuated. Ever since then a discharging sinus has existed."

Eighteen months ago I cut down in the lumbar region, enlarging the sinus, and scraped out an abscess cavity, which was practically a perinephritic abscess. At that time I also removed a quantity of small calculi

that must have escaped from the abscess in the kidney. The patient got very much better and went home. The other day he returned with the same sinus open in the lumbar region, and discharging more or less purulent matter. He was emaciated and cachectic, more so than at present, for I have delayed operating on purpose to allow him time to regain his strength to some degree. His present condition needs some explanation, which, perhaps, cannot be made complete until the operation is over with. The patient states that there is in the left iliac region a swelling which causes some pain of a colicky nature. This sometimes persists for several hours, and sometimes disappears at once if he lies down. He does not notice the swelling nearly as much if he lies down. I find on percussing over the swelling that it is tympanitic, showing that it is probably the colon pushed forward by something behind. Now, if I have any theory to account for the condition present, it is that there is still a large cavity in the neighborhood of the kidney partly filled with pus and fluid, and that this bags down when the patient is in the horizontal position, crowding the colon forward and subsiding again when the man lies down. He says that he has passed blood in the urine and pus in the stools. I am not disposed to dispute his assertion that there was blood in the urine, but I believe that he was deceived, by the presence of mucus from a slight catarrhal enteritis, into thinking that there was a purulent discharge into the bowel. To-day I purpose making a more extensive operation than before, and I imagine that there will be found a calculous pyelonephritis with an extensive abscess, originally perinephritic, but now, perhaps, involving the tissues of the kidney. Renal calculi are usually small, but they are capable of producing a disturbance out of all proportion to their size, and I think that the trouble outside the kidney is due to trouble within. This condition may call for extensive incision so as to allow for free drainage, or it may be necessary to remove the whole kidney.

The presence of stone in the kidney is sometimes plain, at other times it may lie in the kidney a long time without causing serious symptoms. It is astonishing how a large stone may form in the kidney, making a nest for itself and causing practically no disturbance of the renal function ; while, on the other hand, a man may suffer acutely from a very small stone. There is no relation between the size of the calculus and the severity of the symptoms. There may be stones so small as to be no more than gritty particles disseminated through the kidney, and such calcareous matter seems to have been precipitated from fluid in the course of its elaboration into urine. On the other hand, it is possible to have stones as big as a hen's egg formed by gradual accretion on a small nucleus. The ordinary signs of calculous pyelonephritis are more or less pain referred to the lumbar region, and which may radiate thence, especially down the course of the ureters to the bladder ; secondly, a good deal of sympathetic bladder disturbance which may be so exaggerated as to make you think of stone in the bladder ; and, thirdly, characteristic appearances in the urine, such as a sediment of pus

and kidney epithelium or a copious deposit of urates, phosphates, etc., according to the nature of the calculus; fourthly, general malaise, more or less distant reflexes, such as headache; fifthly, disturbances of nutrition, including emaciation, cachexia, etc.; sixthly, tenderness over the affected kidney as compared with the other side. I grant you that this is a somewhat vague clinical picture, and you can readily imagine that various mistakes in diagnosis may occur. Often the diagnosis can only be made by long study of a case, excluding one condition after another. For instance, the presence of mineral salts in the urine and certain vague symptoms may suggest calculous formation somewhere. By sounding carefully you may exclude stone in the bladder, and, since a stone seldom remains long in the ureter, or is there at all without causing the violent symptoms of colic, it is sufficient for practical purposes to consider that if there is a urinary calculus which is not in the bladder, it must be in the kidney. On careful palpation in some cases you will feel an enlargement of the kidney, and the same palpation will probably evoke the complaint of greater tenderness on the side of the enlargement. But not rarely both kidneys are involved in the same disease, and there is an absence of contrast. When you seek to determine whether the stone is impacted in the pelvis of the kidney or not, the diagnosis is more difficult. After a stone has been impacted for a long time it usually sets up more or less suppuration and disorganization, and a kidney in which a stone is thus lodged is incapacitated for its normal function, and it gradually becomes changed into a complicated mass of abscess cavities enclosed in cicatricial tissue and degenerated renal structure. A useless kidney involved in this kind of disease is much better removed than left in place.

The patient, having been etherized, is placed in the right latero-prone position, the lumbar region supported by two pillows. You can see the scar of my earlier incision. I first probe to touch any hard bodies that may lie in line with the sinus, but I find none. The sinus is now enlarged, and I can scoop out quite a handful of pus and necrotic tissue. I am now right in the site of the kidney, which is so degenerated that I doubt whether I can remove it entire. I am pursuing the operation through the lateral incision here about as König recommended it. I am now getting to the hilum of the kidney where the vessels are, and I shall try to get a ligature around them, a procedure which is rendered difficult by the strong adhesions which are most developed at the upper and spinal borders. The kidney is riddled with abscesses, pus oozing out from a number of points. The ligature of strong silk is worked around the kidney from beneath. I will also introduce a piece of rubber tubing in the same way, so as to have an additional safeguard. At one point there has been sufficient rupture of these friable tissues to allow the colon to prolapse. This break I will stop for the present with iodoform gauze. It is impossible to remove the kidney nicely; I shall, therefore, scrape and cut it away in pieces as thoroughly as possible. In doing so I have opened into another abscess in its structure. Now,

having removed about a lateral half of the kidney, I shall tie the silk ligature and gradually relax the rubber tube. It is doubtful if this will be enough to prevent hemorrhage. No, I find two or three vessels spurting, but it is possible that they may be stopped with individual ligatures. In order to prevent all possibility of secondary hemorrhage, I will tie the rubber ligature also, and leave the ligatures in place till they come away of themselves. The peritoneum is sewed with fine catgut carried in a small curved needle. The stump of the kidney is seared with the thermo-cautery. The wound is further disinfected with hydrogen peroxide. As the man will lie on his back, drainage will be good accordingly without inserting any tubing, as the cavity is stuffed with iodoform gauze and the outer wound partly closed with silkworm gut. The ordinary straight lumbar incision would not have given me room enough for this operation. With the lateral opening the operation was easy so far as the opportunity for getting at the deep structures was concerned, though impeded by the firm adhesions.

MASTOID OPERATIONS.

CLINICAL LECTURE DELIVERED AT THE POST-GRADUATE MEDICAL SCHOOL AND HOSPITAL OF CHICAGO.

BY SETH SCOTT BISHOP, M.D.,

Professor of Otology in the Chicago Post-Graduate Medical School; Surgeon to the Illinois Charitable Eye and Ear Infirmary.

GENTLEMEN,—Various mastoid operations have been devised, but for our purpose it will be necessary to describe two only,—Schwartz's and Stacke's. In those rare cases in which we have to operate for primary mastoiditis, or disease of the mastoid process without middle-ear complication, Schwartz's operation is preferable. We will consider this first.

The preparation of the patient is the same for both operations. The bowels are flushed by means of a laxative given the previous night and an enema on the morning of the operation. The head is shaved for a distance of three inches above and behind the ear and scrubbed with soap and warm water. The instruments are boiled, the patient anæsthetized, and the operator's hands scrubbed.

I abandoned the use of chloroform several years ago, not because I had seen a patient killed by it, but I had come so near to it on the last occasion of my having administered it for a dentist, that I have never since had the temerity to use it. I have enjoyed quite a large experience with chloroform and ether during the past twenty-five years and have never had cause to regret the use of the latter. So I employ no chloroform in my private or hospital practice.

In dividing the tissues, the incision should begin at the apex of the mastoid and extend upward to within one-fourth of an inch of the auricular attachment, and follow the latter in this relation to its superior junction with the side of the head. Why do I advise you to make the cut from below upward while most operators reverse this order? It is because you are bearing hard upon your knife to divide the tissues to the bone, and if the direction is from above downward, when your knife reaches the lower border of the bone it may suddenly plunge down into the soft tissues of the neck.

The kind of a periosteum separator (Fig. 1) that I show you is used

FIG. 1.



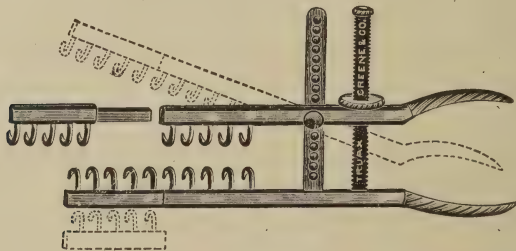
Periosteum separator.

to lift the membrane both forward and backward from the incision sufficiently to give plenty of room for the work to follow. You will observe that this elevator is bevelled on the side opposite to the one that is usually ground. This prevents the thickest point of the bevel from acting as the fulcrum of a lever to raise the cutting edge above the membrane, while it should be kept below it in order to separate it and preserve it. This instrument is useful, moreover, as a curette and as a single retractor.

The periosteum being now separated from the bone as far backward from the bony meatus as necessary, the double retractors are introduced, closed, the teeth interlocked and resting on the denuded bone. The jaws are then separated as widely as possible and fastened.

These retractors (Fig. 2) control the hemorrhage from the soft tissues,

FIG. 2.



Retractors.

and take the place of one assistant by keeping the wound open for work. The bone is then opened with the chisel and mallet, beginning on a level with the meatus and one-fourth inch behind it. The direction of the opening must be made inward and a little forward and upward. In the relative use of these terms one must keep in mind the changed position of the patient's head while lying on the back. Forward becomes upward, and

upward backward. The internal opening in the bone ought to be made large enough to enable the operator to see plainly all of the diseased field within.

As far as we have proceeded direct light can be used, but for the remainder of the work brilliant illumination of the cavity should be obtained by means of the forehead mirror reflecting sunlight, or a good substitute. Unless the sunlight is well diffused, which can be done if you keep the mirror far enough from the wound, the light is too intense and trying to your eyes, and the heat is too great. I have used the Argand gas-burner with my light concentrator, and the Wellsbach sixty-candle power burner, with satisfactory results. Electric light is preferable, for the reason that it affords no danger of an explosion of the anæsthetic. I never witnessed such an accident, but the anæsthetizer is cautioned to keep the ether-can well corked and away from the source of light.

Now that we have the bone open, what shall be our rule of action? Go as far as you find dead or diseased tissue in every direction. I have repeatedly found it necessary to expose the dura, but never saw any harm result. Avoid injuring the dura if there is no occasion to penetrate it. The operation will not be a complete success unless this rule is obeyed. Tentative measures are not in place here. If diseased or dead tissue is left, it is as bad as a foreign body and the disease is not eradicated. The antrum being exposed, strong curettes of various shapes and sizes are necessary to scoop out all of the diseased granulations, cholesteatomatous masses, and unhealthy bone. Extreme care must be taken to avoid injuring the lateral sinus on the one hand and the facial nerve and semicircular canals on the other,—the Scylla and Charybdis of mastoid operations.

To illustrate the surgical relations of these organs I will now show you nine specimens presenting various sections of all parts of the temporal bone. I have performed Schwartz's and Stacke's operations on the opposite sides of this skull so that you will be able to compare the two. So far as the bone is concerned Stacke's operation is also Von Bergmann's. These specimens prove what a thin shell of bone forms the outer wall of the Fallopiian or, as I prefer to call it, the facial canal. Its course I have marked above the oval window and at the back of the tympanic cavity so that its course and location will be the more readily remembered. On one side, with Schwartz's operation, I have laid open this canal and exposed the enclosed nerve, and on the other side of the skull, with Stacke's, I have removed a part of the external wall of the external semicircular canal and have indicated these with colored paints,—danger signals, once seen, never forgotten. By holding the skull between you and the light you will see the imitation blood in the lateral sinus through the thin wall that separates it from the mastoid cells. If you are unfortunate enough to open the sinus, plug it immediately with antiseptic gauze until the hemorrhage is controlled, and then continue the operation in the proper direction. You may be deceived into thinking that you have struck the sinus when you have opened an enlarged diploëtic vein. Pressure will stop the bleeding.

If the middle ear is diseased, I convert that cavity and the antrum into one, and remove the hammer and anvil if they are unhealthy. In suppuration they are an obstruction to the exit of pus and to the thorough cleansing and medicating of the middle ear, so it is better to have them out of the way. Be sure, gentlemen, to have a strong light constantly reflected into these cavities by a concave, perforated mirror on your own head. It is convenient to have an assistant also do the same with a large reflector, so that, when you turn your head away for an instrument, he can dry up the blood and save time. In connection with this idea of economy of time let me urge you to lose no time unnecessarily, for it is a long operation at best, and it is liable to be followed by considerable trouble in the respiratory passages, especially by bronchitis. My anæsthetizer is always instructed to administer only enough ether to keep the patient from suffering, and to allow plenty of air. With these precautions patients rally better.

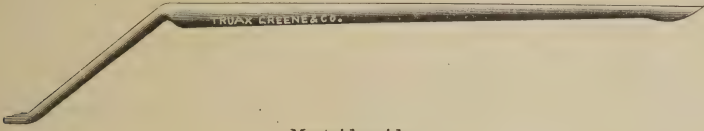
Now that we have left nothing but healthy tissue in sight, the wound is washed gently with a quart of quite warm bichloride solution—1 to 5000—from the irrigator, is dried, and covered with a coating of aristol (dithymol diiodid). This is our best cicatrizant, and possesses some anæsthetic property. Pain may follow the application of boracic acid, but disappears when aristol is substituted. Iodoform gauze is very lightly packed into the wound, and this is covered with a compress of absorbent cotton and a net bandage. If you pack the wound too forcibly, you may produce sufficient pressure on an exposed facial nerve to produce facial paralysis. The patient is put to bed for the first week, and if no symptoms call for care the dressing is not disturbed for three or four days. Should there be fever, pain, odor, discharge, or any suspicious symptom pertaining to the wound, the dressing is removed at once. At each dressing the parts are irrigated, but with only enough force to wash off what ought to be removed, and not with enough power to drive any discharge into the tissues. I dress wounds frequently. If there is a doubt as to the necessity of a dressing, give the patient the benefit of that doubt, and ever remember that to be clean is divine. Dirt may kill, cleanliness never.

Stacke's operation is performed in the same manner as Schwartz's, as far as we have gone. To convert Schwartz's into Stacke's you remove all of the posterior wall of the external bony meatus, after having first dissected out the cutaneous portion of the canal and reflected it forward with the auricle under the double retractors. Then, at the end of the operation, the posterior wall of the integumentary meatus is incised longitudinally from its inner to its outer end. At the cartilaginous extremity of this incision another is made at right angles to it, extending one-fourth the circumference of the canal above and below, so as to allow the flaps so made to be reflected, the one upward and the other downward and backward into the wound. These flaps are held in place by the dressing.

Stacke's method converts the antrum, middle ear, and external canal all into one cavity, and renders it more accessible to thorough after-treatment.

In either operation you are far less likely to injure the facial nerve and semicircular canals if you rely upon the mastoid guide. In Schwartz's operation it has to be introduced through the cutaneous meatus into the middle ear and aditus, but in Stacke's it is passed along the posterior bony wall until it enters the aditus.

FIG. 3.



Mastoid guide.

This mastoid guide (Fig. 3) I have had made with a tapering toe. It is also narrower than those that I formerly used. I have demonstrated in a number of instances that the breadth of the foot-plate of those commonly used is too great to allow of their passage into the aditus. I have designed this guide for a double instrument by having the handle made into a meatus separator. In separating the periosteum and skin from the osseous canal, the convex side of the separator is kept in contact with the bone, while the instrument is forced along the wall down to the attachment of the drum-head. Then it is moved sideways either way until the posterior half of the cutaneous canal with the periosteum is detached throughout its whole length. The sharp end of the handle must be kept in close contact with the bone so as to save all of the periosteum. This instrument is more effective than the little knives we have used for this purpose heretofore. It is more easily managed, does not chip and break like the knives, and does more than the knives, by preserving the periosteum.

I do not remove the whole cutaneous canal like a glove finger, but detach the posterior half only. I think it better not to disturb the anterior half of the meatus, for we have sufficient room for work and leave a less extensive and serious wound to be healed.

If the assistant holds this mastoid guide in such a manner that the foot-plate projects through the aditus into the antrum, and the handle is directed over the patient's cheek accurately in a line with the lower border of the upper teeth or lip, the foot-plate will lie over the facial canal and protect it from injury by the instruments. If an instrument should be carried too deeply it will strike the guide before impinging upon the canal or nerve. But the assistant who manages the guide should have nothing else to attend to, and should constantly see that the position of the foot-plate and the direction of the handle are correct.

The end of the handle, you will notice, is not sharp enough to hurt the patient's cheek or the assistant's hand with ordinary care, and it is delicate enough to operate in a child's ear. While the heel of the foot-plate is broader than the toe, it will enter the aditus, for in the cases in which it is designed to be used the bone is diseased and softened about the aditus, and is easily made to yield to the instrument.

Stacke's operation is to be preferred in those cases of extensive mastoid disease associated with middle-ear suppuration. The time required for the cure of these cases varies from four weeks to four months. If all diseased tissue is not removed, or if the wound cavity is not kept freely accessible for subsequent treatment, it may take longer.

I advise opening the mastoid process—

1. When there is an acute inflammation of the bone that resists palliative treatment.

2. When repeated swellings and abscesses occur.

3. When there is bulging of the posterior and superior wall of the meatus with suppuration of the middle ear.

4. When there is a fistula.

5. When there are severe pains in the same side of the head as the diseased ear, which resist all other treatment.

6. When a fever otorrhœa cannot be cured by any other means.

Gentlemen, I have dwelt upon the details of these operations for the reason that I have always been impressed with the fact that the most brilliant success followed the closest attention to the little things. If the minute details of an operation are faithfully observed, the conspicuous points will not escape us; but if the gaze is fixed upon the loftiest barren peaks of a mountain range, the far more fertile foot-hills may be overlooked.

REVIEW OF MEDICINE.

MEDICINE.

IN CHARGE OF JOHN H. MUSSER, M.D.,

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AND

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Paralysis Consecutive to a Pseudo-Membranous Angina which was proved Non-diphtheritic by a Bacteriological Examination. (*Archives de Médecine expérimentale et d'Anatomie pathologique*, January 1, 1895.) By M. H. Bourges, M.D.

The following seemingly rare case presents conditions commonly following diphtheria, but as the microbiologic test leads to more careful diagnosis the same conditions may perhaps be recognized in allied diseases.

Ernest P., aged seven years, complained on June 12, 1894, of headache, fever, and pain in the throat. On examination the tonsils were found to be

swollen and grayish in color, but no false membrane was seen. These symptoms under treatment disappeared in twenty-four hours. On June 21 a violent fever came on with slight coryza. On the next day a rubeolous eruption appeared on the face, neck, forearms, and legs. The throat was normal and the temperature fell after the appearance of the eruption. The latter disappeared on the second day and was not followed by desquamation. The child then remained well until June 30, when the symptoms first noted again appeared, accompanied by a very white, easily-detachable, false membrane on both tonsils.

A few days later the mother became sick in the same manner, and a piece of membrane was taken from each throat for examination. The mother soon recovered, but the child remained pale and sickly after the disappearance of the membrane, and on August 5 was taken with night-terrors and grinding of the teeth, followed the next morning by pain in the abdomen, headache, and slight fever. On the following day a convergent strabismus was noticed. Two days later the voice became nasal and he coughed when swallowing liquids. These last symptoms quickly disappeared, but the strabismus remained stationary for fifteen days, and he did not recover wholly until the last of September.

A bacteriological examination by cover-slips, the making of cultures, and the inoculation of mice, all showed the same organism. A streptococcus was found in abundance in the membrane from both patients.

A paralysis, therefore, presenting the same characteristics as that produced by diphtheria, affecting first the muscles of the eye, then of the palate, and later the inferior extremities, was caused by an angina which was not diphtheritic, as shown by examination not only of membrane from the child, but also of that from the mother who contracted the disease from the child.

Anticholera Inoculations in India. (*British Medical Journal*, November, 1894.)

Twenty-five thousand persons in India had been inoculated down to June last. Haffkine, with the co-operation of Professor Hankin, prepared the inoculating fluid. The value of the inoculations has not been decided, as there has not been sufficient occasion to put them to the test. In a limited epidemic in a village near Calcutta, one hundred and sixteen out of the two hundred inhabitants were inoculated, and of the ten new cases which appeared not one of them had been inoculated. In a trial of the method in Ganga Gaol, Surgeon-Major Macrae concluded that the inoculations afford protection, but that the protective influence is not exerted until several days after inoculation, and that the protection increases from day to day for a period of time as yet unknown, as sufficient data have not been made to arrive at definite conclusions. Haffkine hopes to modify his method so as to bring about a condition of immunity at an earlier date. In the epidemic which attacked the East Lancashire Regiment at Lucknow,

the protective influence of the inoculations was not so clearly noted, and this occurrence has been spoken of as a proof of the failure of anticholera inoculations.

Traumatic Glycosuria. (*Boston Medical and Surgical Journal*, February 28, 1895.) By F. A. Higgins, M.D., and J. B. Ogden, M.D.

The results of the observations made from frequent and systematic examinations of the urine in two hundred and twelve cases of head injuries are tabulated and arranged in classes according to the nature of the head injury. Of one thousand five hundred and sixty-three patients, the whole number of accident cases admitted to the hospital for the same thirteen months during which the head cases have been studied, no case apart from those with head injuries was found to have glycosuria. Of all classes of head injuries taken together about ten per cent. manifested glycosuria as the result of traumatism, while of the severe cases from twenty per cent. to twenty-five per cent. had glycosuria. Sugar may be present in the urine after slight head injury, but more frequently follows severe injuries. Albumin, together with casts and abnormal blood was found in every instance in urine containing sugar, probably secondary, in most instances, to renal irritation produced by sugar.

From observation of these cases the authors conclude as follows:

1. That after injury, sugar may appear in the urine as early as six hours, and disappears within twenty-four, the average time for its appearance, however, being from eight to twelve hours; for the disappearance of the same, from the fifth to the ninth day.
2. That a small number of cases may exhibit a permanent glycosuria from the date of injury of the head.
3. That acetone and diacetic acid are rarely found in such cases, excepting where the condition becomes a permanent glycosuria.
4. That of twenty sugar cases here recorded, eleven (fifty-five per cent.) had received an injury to the right side of the head; five (twenty-five per cent.) to the left side; three (fifteen per cent.) to the occiput, and two (ten per cent.) where there was no external evidence of violence.
5. That it is impossible in the present state of the knowledge of the pathology of diabetes and glycosuria to draw any inferences from the autopsies which have been obtained.
6. That there is little to be said in regard to mortality. Of the twenty cases, eight died; six being the direct result of severe injuries, one from intercurrent disease, and the third probably from alcoholism. In the two hundred and twelve cases, sixteen were fatal, fifty per cent. of these having glycosuria.

Nutmeg Poisoning. (*American Medico-Surgical Bulletin*, 1894, vol. vii.) By Alexander L. Hodgdon, M.D.

The writer reports a case in which a woman was poisoned by eating two nutmegs at night and the same quantity the next morning. When he saw the patient the following afternoon the pulse was 120, the pupils widely dilated and not contractile to light; she was very drowsy, and there was pain

in the region of the umbilicus. A decoction of strong tea and tablets of digitalis, strophanthus, belladonna, and nitro-glycerin were administered, and one grain of caffeine citrate was given every hour or two. The next morning the pulse was 80 and very weak and wavy, the pupils were very much contracted, the temperature rose one degree, and the urine was loaded with phosphates. On the fourth day there was sweating confined to the lower extremities, which with the mydriasis formed the most interesting features of the case.

New Diaphragmatic Phenomenon. (*Berliner medicinische Gesellschaft.*)

This phenomenon is described by Herr Litten as an undulating line which extends from the vertebral column to the seventh rib, and synchronous with the movements of the diaphragm. This line of movement can be seen on the thoracic walls, and shows the limits of the diaphragm during inspiration and expiration. The upper point marks the margin of the liver in a state of rest, and the lower in deep inspiration. Abnormal conditions may be determined by this means. In emphysema the line is lower and more limited. In pleurisy with effusion the movement is much lessened. If the diaphragm is above the line of dulness the case is one of subphrenic abscess; if below, it is one of pleuritic exudation.—*Universal Medical Journal*, March, 1895.

THERAPEUTICS.

IN CHARGE OF ALEXANDER D. BLACKADER, B.A., M.D.,
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ASSISTED BY

D. J. EVANS, M.D.

On the Employment of Naphthalin in the Treatment of Oxyurides in Children. (*Jahrbuch für Kinderheilkunde*, vol. xxxix. Nos. 2-3; *Therapeutische Wochenschrift*, February 17, 1895.) By Aurel Schmitz, M.D.

As naphthalin is a powerful antiseptic and germicide, and undergoes almost no change in passing through the bowel, Professor Ungar, of Bonn, more than a year ago advised its use as a remedy in this very troublesome affection. The writer reports his experience with it in the treatment of forty-six cases suffering from oxyurides. His method of employing the drug is as follows: After the bowels have been thoroughly cleansed by means of a mild purgative, a dose (0.15 grammes for a child of one and one-half years up to 0.4 grammes for a child of twelve years) is given midway between meal-hours, mixed either with a little sugar or in a capsule. This is repeated twice daily till four doses have been taken. Then a pause of eight days is made, and, if necessary, the course is repeated. A third

course may be given after an interval of fourteen days. It is very important that, during the administration of the drug, fat, as far as possible, should be withdrawn from the dietary, as its presence favors the absorption of the drug. If there be constipation, mild purgatives should be given after each course of the drug. With these precautions he says the drug is well borne. In twenty-six of the forty-six cases treated one course proved sufficient. The writer thinks that, given in this way, naphthalin is less dangerous than santonin.

On Hydrobromate of Scopolamine. (*Therapeutische Wochenschrift*, January 20, 1895.) By Leopold Grossman, M.D.

This alkaloid, obtained from the root of the *scopolia atropoides*, has proved itself of much value as a mydriatic and antiphlogistic. Compared with atropine, the differences may be stated as follows: In normal eyes, a two-per-cent. solution produces enlargement of the pupil in from eight to ten minutes; this reaches its maximum in from fifteen to twenty-five minutes, about half the time required by a one to one-hundred-and-twenty solution of atropine. Paralysis of accommodation ensues in thirty to thirty-five minutes, while with atropine it requires fifty to sixty minutes. The pupil regains its normal size within from four to six days, while after atropine seven to ten days are necessary. Combined with cocaine, the action of scopolamine is intensified, while that of atropine is weakened. A one-per-cent. solution can be used several times daily for months without the appearance of disagreeable toxic symptoms.

On Trional. (*The Lancet*, February 16, 1895.)

In an editorial, attention is directed to a contribution by Dr. K. Ryehinski on the action of this drug, which appeared in a recent number of the *Neurologisches Centralblatt*. Fourteen cases of sleeplessness, due to various causes, chiefly psychical, were treated with this drug, and its action compared with that of sulphonal, chloral hydrate, and duboisine. In certain cases of long-continued insomnia, trional, in doses of from one-half to one gramme, was efficacious without producing any headache, while in the same cases sulphonal and chloral hydrate proved inefficacious or secured only a short sleep. In two cases, large doses of four grammes of trional were necessary to secure an unbroken sleep of eight or ten hours; in these two chloral hydrate and sulphonal proved more efficacious. Trional, when given in a hot drink, usually procures sleep within half an hour, but occasionally as long as two hours intervene before sleep is induced. In a case of mitral regurgitation there was no evidence of any bad effect produced on the heart, and this was confirmed by sphygmographic tracings. The editor says that, although further experience of this drug is requisite, experiences such as those recorded in this paper suggest that in trional we may find a safe, efficient, and reliable hypnotic.

Claus (*International klinische Rundschau*, 1894, No. 45, *British Medical*

Journal, February 9, 1895) speaks of the value of trional in the sleeplessness of children. It is mostly to be avoided in the insomnia of organic nervous disease, but is very useful in chorea, convulsions, and night-terrors. Trional is of little service when the sleeplessness is caused by pain. In the insomnia due to toxic influences chloral is more effective. In one case the child showed some ataxia in the morning, owing, possibly, to too large a dose of the drug.

On the Value of *Solanum Carolinense* in the Treatment of Epilepsy. (*Therapeutic Gazette*, February 15, 1895.)—Attention is called in an editorial to a paper on this subject by Dr. Maxwell, of Indianapolis (*Indiana Medical Journal*, November, 1894), in which the writer concludes that this drug materially controls epileptic seizures and is worthy of considerable confidence. The editor says that, while it is not yet time to speak positively of its therapeutic powers, so far as it has been tried the results have been encouraging. The observers quoted by Dr. Maxwell employed what is known as the *succus solanum*, but the editor recommends the fluid extract, carefully prepared, of which ten to fifteen drops may be given after meals three times a day.

On the Action of Malakin as an Antipyretic and Antirheumatic. (*Edinburgh Medical Journal*, February, 1895.) By Robert Abernethy, M.D.

The writer says that, in his experience, malakin has proved of much value in pyrexia of rheumatic and other origin after other antipyretics had failed. It is said to be a salicylidene paraphenetidine, which, in the presence of the acid of the stomach, is decomposed into salicylic aldehyde and paraphenetidine. The former, on being absorbed, is, according to Schmiedeberg, oxidized into salicylic acid, and can be recognized in the urine. He gives the history of a case of rheumatism which seemed to yield to this drug very rapidly in doses of fifteen grains three times a day.

On Cardiac Therapeutics. (*The Lancet*, February 16, 1895.)—In a discussion on this subject in the Medico-Chirurgical Society of Edinburgh, Dr. T. R. Fraser, after speaking of the value of the digitalis group as strengtheners of the cardiac contraction, said that it was claimed for strophanthus that it had been shown experimentally that it increased the cardiac contraction better than any other drug. It was entirely soluble, and so was superior to digitalis. The action of digitalis on the blood-vessels was greater than its action on the heart, and hence its use was restricted, as it increased the work the heart had to do. The one indication for the use of cardiac tonics was cardiac insufficiency, and the practitioner should use the drug with whose action he was most familiar. Dr. G. W. Balfour agreed as to the importance of rest and diet. He had been rather disappointed in the use of strophanthus, probably owing to its want

of action on the blood-vessels, and hence the blood-supply of the heart was not so much increased as by digitalis. Where there was obstruction in front in the shape of diseased arteries vascular stimulants must be used, or the heart may become irritable and irregular in consequence of being thrown into a state of strain. Of these, he preferred iodide of potassium because he found it efficacious. In doses of two or three grains it quieted the heart, apparently because it prevented the action of digitalis on the arterioles. The iodide was more permanent in its action than nitrites or other drugs. Potassium iodide given in moderate doses dilated arterioles, reduced blood-pressure, and allowed an aneurism to contract. Large doses were not good. The patient was put to bed, the recumbent pulse-rate ascertained, and the iodide administered in increasing doses till the pulse-rate began to rise. We thus got the exact dose necessary to dilate the arterioles. Sir J. Grainger Stewart said that he found digitalis more successful than strophanthus. Strophanthus, however, appeared better for an emergency. It was important not to use cardiac tonics if there were active changes going on in the heart. In those cases he preferred iodide of potassium.

On the Employment of Pilocarpine in the Treatment of Urticaria. (*New York Medical Record*, March 9, 1895.) By Augustus Eshner, M.D.

In a short communication the writer states the very satisfactory results which he has obtained from the use of pilocarpine hydrochlorate in the treatment of acute and chronic urticaria. The drug has such a pronounced effect upon the circulatory and secretory activity of the skin, and he had observed such favorable results from its employment in the treatment of erysipelas, that he deemed it worthy of an empirical trial in the treatment of urticaria. His results confirmed the reports of Abrahams (*Medical Record*, September 15, 1894) and of McBrayer (*Ibid.*, November 3, 1894).

SURGERY.

IN CHARGE OF HENRY R. WHARTON, M.D.,

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Relapsing Typhlitis. (*British Medical Journal*, March 9, 1895.) By Frederick Treves, F.R.C.S.

This article supplements a former one in this journal for April 22, 1893, in which fourteen cases were reported. Eighteen cases with complete

histories are now cited, operation having been performed, in accordance with the writer's views, during the quiescent period after every sign of inflammation had disappeared.

The author considers that localized peritonitis—typhlitis, perityphlitis, and appendicitis—is due in the majority of cases to the *bacterium coli commune*. This organism has been demonstrated to be present in the entire length of the alimentary tract, and appears to be harmless when found in the normal intestine, but is easily increased in virulence by any morbid condition, as obstruction of the bowel, strangulation, inflammatory diarrhoea, and advanced constipation. The preventive treatment of the affection consists of means that render the bacteria non-virulent.

Two elements are necessary for the production of an attack of localized peritonitis through the medium of the appendix; the first is a lesion of the bowel which renders the colon bacillus virulent, and the second a lesion in the appendix that will permit the bacteria to reach the peritoneum. In this affection several attacks usually occur unless the first terminates in suppuration and by this means removes the cause of the trouble. The morbid conditions necessary to produce relapses may be occlusion of the lumen of the appendix, the contents of the tube being unable to escape; inflammatory material may be embedded in a mass of firm adhesions; the organ may be in a condition adapted to volvulus; or a calculus or fæcal concretion may be lodged within it. Ulceration and perforation play little part as causal factors.

The cases adapted for operation are few. Where there is constant tenderness, some swelling in the cæcal region with frequent attacks of pain and fever, no measure short of operation will answer, as the appendix is then distended with pus. In examples not so marked the attacks of typhlitis may be brought to an end by the following measures: The digestion must be carefully watched; the food must be simple, digestible, and well masticated, the meals regular, and a period allowed for rest after eating, the bowels must act daily. Massage of the abdomen has an admirable effect by promoting the absorption of inflammatory exudates and encouraging normal action of the bowels. Intestinal antiseptics are useful, of which salol appears to be the most efficient.

In these operations with one exception the incision has been made directly over the cæcum. The dealing with adhesions constitutes the real difficulty of the operation, as they may hide a perforation in the cæcum or contain a thin and dilated ureter. The iliac veins are also in some danger. After the incision is made, the serous coat of the appendix is divided, the process is ligatured, the projecting mucous membrane is then cut away and the detached peritoneum carefully stitched over the stump. The wound is closed by means of a continuous silk suture of the peritoneum and a series of silkworm-gut sutures which involve the muscles and skin.

A good recovery followed operation in all these cases except one, which was twice postponed on account of the nervous excitement of the patient.

A nervous restlessness developed after operation with ceaseless movements which continued until his death on the fourth day.

Blood Alterations of Ether Anæsthesia. (*Medical News*, March 2, 1895.) By John Chalmers Da Costa, M.D., of Philadelphia.

The author considers it highly probable, from his observations, that the cause of the anæsthetic state is not merely the direct action of ether upon the nerve-elements, but involves likewise an alteration in the composition of the blood. A suddenly diminished amount of hæmoglobin does tend to the production of malnutrition and unconsciousness and may account for the depression and other conditions which have hitherto been unexplained.

Blood examinations were made in twenty-nine cases, both before, during, and after recovery from the anæsthetic state. The blood-counts were made with the Thoma-Zeiss hæmocytometer and the hæmoglobin was estimated by Gowers's and Fleischl's hæmoglobinometers. There was found a constant marked diminution in the hæmoglobin, with alteration in the shape of the corpuscle, but no marked diminution in their number.

The mode in which the hæmoglobin is removed, the author thinks may be explained by the rapid evaporation of ether in the air-cells of the lungs, which produces great cold, and, the cold blood being subsequently warmed by circulation through the other parts of the body, the hæmoglobin passes out of the corpuscle into the blood-liquor as it does in similar conditions outside of the body. The occasional occurrence of jaundice after etherization seems to indicate that in some cases at least the removed pigment goes to the liver and is there broken up.

The altered shape of the corpuscles is attributed to removal of hæmoglobin and the dissolving out of fat by the ether.

Conclusions.—1. Etherization produces a marked diminution in the hæmoglobin of the blood. 2. The red corpuscles and the hæmoglobin are especially affected in blood previously diseased,—in such conditions, for instance, as anæmia. 3. Irregular reports are due to faulty observation, to the presence of altered hæmoglobin in the blood, to the faulty aberration as to color of a Fleischl instrument, or to taking the blood before anæsthesia is completed. 4. The white corpuscles show irregular changes which are not characteristic, and exhibit variations not more pronounced than would be found in the same number of samples of normal blood on different examinations. 5. Age does not apparently influence the results. 6. Ether-pneumonia may possibly be due, in some instances at least, to the action of intense cold upon the lungs, produced by the action of ether-vapor. 7. Œdema of the lungs may arise from contraction of the pulmonary capillaries, thus producing a loss of *vis a tergo* and damming up of blood in the veins. Furthermore, the same conditions may produce sudden paralysis of the heart. 8. The often-quoted observation as to the effect upon the hæmoglobin of shock and hemorrhage requires enlarged repetitions upon human beings before the statements can be unreservedly accepted that hemorrhage causes a great fall

in the amount of hæmoglobin, but that shock does not affect it. 9. The chilling of the blood-stream may be responsible for the nephritis that occasionally follows etherization. 10. Prolonged anæsthesia profoundly deteriorates the blood and strongly militates against recovery; hence rapidity of operation is most desirable.

Cholecystotomy and Cholecystectomy for Stone impacted in the Cystic Duct. (*Medical Record*, November 3, 1894.) By Maurice H. Richardson, M.D., of Boston.

Two interesting cases are reported, both of which recovered. The author urges the importance of operation early in the case, before the patient's vitality has been exhausted by prolonged illness, and before the obstruction has extended to the common duct. The deplorable results of gall-bladder surgery arise from our failure to heed the warning of the disease in its incipency,—in our neglect to remove the source of future disasters at a time when the procedure may be accomplished with very slight danger.

Operations upon the gall-bladder undertaken when the patient is in good health, before the obstruction has checked the escape of bile through the common duct, are followed by the most brilliant and gratifying results. Hence, to the surgeon, it seems folly, in cases of persistent and repeated biliary obstruction, to attempt the removal of gall-stones by medicinal means. Sooner or later, in most cases, a stone gets impacted in one place or another. It grows, becomes rough, and not easily detachable, and finally, if it does not cause death by sudden rupture into the peritoneum, the grave symptoms to which it gives rise convince even the most conservative of the necessity of an operation,—an operation which then must be done under the most unfavorable conditions, and with a prognosis infinitely graver than in the early days of the disease.

Injuries of the Vertebral Column and Spinal Cord and their Treatment. (*Lehigh Valley Medical Magazine*, March–April, 1895.) By J. C. Biddle, M.D.

The author thinks that operations for laminectomy are attended with as good results as those upon the brain or abdomen, if one takes into consideration the nature of the surroundings. In all cases of dislocation with extreme displacement of the vertebral column, or in fracture dislocations where the cord has been crushed or lacerated, the injury is irreparable. An exploratory incision affords the only means of ascertaining the extent of the injury, for the vertebral column is so thickly covered by muscles that it is impossible to detect the usual symptoms of fracture-crepitation and preternatural mobility. The extravasated blood is allowed to escape, thus preventing a possible abscess. The spines of the vertebra should be removed near the seat of injury, thereby preventing pressure with bed-sores. By this accurate means of diagnosis you will know whether the paralysis is due to bone-pressure, an intrathecal hemorrhage, or perhaps an

extensive laceration, crushing or causing a total separation of the cord, and from the cause you must deduct, in a great measure, your conclusion for surgical interference. He gives the following account of one hundred and ten cases:

In the time of my service at the hospital one hundred and ten cases of severe injuries to the vertebral column have come under my notice, and were divided as follows:

Fracture dislocations	12
Fractures.....	44
Dislocations	23
Partial dislocations.....	31

Of the 12 fracture dislocations, 9—or 75 per cent.—died, 2 were improved, and 1 unimproved. These were treated nine hundred and sixty-six days.

Of the 44 fractures, 25—or $56\frac{9}{11}$ per cent.—died, 10 recovered, 8 were improved, and 2 were unimproved. These were treated thirty-nine hundred and nine days.

The medical treatment consists in keeping the patient at complete rest, with the upper portion of the body elevated. The bowels should be moved only when it is positively necessary, and then by means of enemas. A soft catheter should be used every four hours to keep the bladder empty. Quinine in five-grain doses four times a day until the physiologic effects are complained of; stimulants—trinitrin and digitalis, with brandy—are given until shock disappears. Morphine and paraldehyde should be administered hypodermically to allay pain, and after the shock has disappeared thirty grains of chloral hydrate should be given to procure sleep. The patient should not be turned on his side during the first four or five weeks. He should be raised by two attendants, one at his shoulders, the other at his legs, who lift him by pulling in opposite directions.

A Series of Thirty Cases of Movable Kidney treated by Operation. (*British Medical Journal*, March 16, 1895.) By W. Bruce Clarke, M.B., F.R.C.S.

The writer mentions two classes of cases of movable kidney,—one which gives prominent symptoms and which he thinks is best described by the term “acute renal dislocation,” the other presents few symptoms and shows a chronic form of this condition.

The symptoms of the acute form are pain, beginning without warning, often following a strain, attended frequently by vomiting, and later by local abdominal tenderness. The pain may be cut short in some instances by manipulation of the kidney, reducing the dislocation. The urine may be scanty and blood-stained or almost porter-colored, but in less severe cases is commonly unaltered.

In twenty-one of the thirty cases the mobility was uncomplicated by any other condition, and dilatation of the kidney-pelvis did not exist, or

had only just begun to appear. Of this number, eighteen were cured. In two of the remaining number the kidney was surrounded by a well-marked mesonephron, which made it necessary to open the peritoneum in order to fix it firmly in position. In one of these cases the severe pains returned in a few weeks, and six months later the kidney was removed. On section a small calculus was found in its interior. The patient then made a complete recovery. In a third case a movable kidney on the left side gave considerable pain, and the right kidney was found to be larger than normal. The right kidney was fixed to the lumbar fascia by two large silk sutures after exploring it thoroughly for a stone. After recovery the pain in the left side gradually ceased, and the woman became able to do hard work. In Case VIII. the symptoms were supposed to be due to renal colic, showing how liable a movable kidney is to be mistaken for renal colic. In Cases X. and XI. the affected kidney was found to be so disorganized that it was considered necessary to remove it at once, and in Case XXIV. it was removed by a second operation. In Case XII. an abscess distended with pus was found. The pus was let out and the kidney was sutured to the lumbar fascia. Rapid recovery followed.

The following points were suggested by a consideration of these cases: the impossibility of distinguishing clinically between kidneys which are surrounded by a mesonephron and those which are movable behind the peritoneum; the character of the movement in the cases mentioned gave no clue to its existence.

The results obtained in operation on movable kidneys depend on the condition of the kidney when operation is performed. Little is gained by leaving a kidney with a dilated pelvis, or with the secreting substance largely destroyed, if the other one is known to be healthy; and the more unhealthy the movable kidney proves to be, the more certain it is that the opposite organ is capable of taking on the work of both sides. If the ureter is lax and elongated, the tendency to form kinks and temporary valves is considerable, and may prevent a successful issue.

NEUROLOGY.

IN CHARGE OF LANDON CARTER GRAY, M.D.,
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A Study of the Operative Treatment for Loss of Nerve Substance in Peripheral Nerves. (*Proceedings of the American Physiological Society*, December, 1894.) By G. Carl Huber, M.D.

The report covered the results obtained in fifty experiments on dogs, in which the various methods that might be employed in the surgical treat-

ment of divided peripheral nerves, where there is loss of nerve substance to the extent that an ordinary suture cannot be made, were tried. Segments varying in length from five to eight centimetres were removed from the ulnar and sciatic nerves of the dogs. In twenty-six experiments a portion of another nerve (usually the sciatic of a cat) was implanted between the resected ends of the nerve operated upon, and retained in place by means of sutures; in eight experiments the resected ends were united by means of decalcified bone tubes; in seven they were united with a number of catgut threads; a flap from the peripheral end of the central stump was made in seven experiments; and grafting the central end of the peripheral portion of a resected nerve to an accompanying nerve trunk was tried twice. After carefully closing the wounds, the animals were allowed to live for periods varying from two to one hundred and eighty-two days; before killing the animals the nerves operated upon were tested as to their conductivity; they were then removed and prepared for histological examination.

1. In all experiments the peripheral portion of the divided nerve degenerated, as also one-half centimetre of the distal end of the central stump.

2. Regeneration was obtained after implantation of a nerve segment, tubular suture and suture *à distance* with catgut threads.

3. Regeneration was from the central ends, buds given off from the central axis cylinders growing towards the periphery.

4. The implanted substance serves only as a guide to the down-growing axis.

5. Regeneration takes place most rapidly (one hundred and twenty to one hundred and thirty days in dogs) after implantation of a nerve segment.

Syringomyelia.—H. Schlesinger in an extensive monograph (Vienna, 1895) publishes an account of thirty-two cases, fifteen with autopsies. In one case (VI.) a woman, aged thirty-nine, presented no loss of pressure sense, localization sense, pain sense, or temperature sense to either warm or cold. In the lower extremities, however, there were hyperæsthesia and hyperalgesia. Increased knee-jerks, kyphoscoliosis, atrophy of the smaller muscles of the left hand, and contractures of the fingers were present. The clinical diagnosis made by both Ewald and Schlesinger was syringomyelia. The autopsy revealed a cavity extending from the lumbar region throughout the entire dorsal and cervical regions as far as the medulla oblongata.

In another case, that of a man aged fifty-three (Case XIV.), a luxation of the twelfth dorsal vertebra occurred after a fall from the fourth story of a building. Symptoms of compression, including retention of urine and incontinence of fæces, followed; at the autopsy, three months later, the central canal throughout the entire dorsal region above the seat of injury was found dilated, measuring at the mid-dorsal region three millimetres antero-posteriorly and one and five-tenths millimetres in breadth. The cavity was partly lined with cylindrical epithelium.

Wrong Reference of Sensations of Pain. (*Medical News*, March 16, 1895.) By S. Weir Mitchell, M.D.

A unique example of false reference of pain is reported which is accompanied by similar instances taken from notes made during the Civil War.

A woman, sixty-two years of age, let a heavy stove-plate fall on the right foot, striking the toes and bruising the great toe and the adjacent one. On the reception of this injury she at once felt acute pain in the left leg (the uninjured side) at the junction of the upper and middle thirds and extending downward into the foot and upward to the thigh. This pain was so sharp as to distract her attention from the injury received on the right foot, and the referred pain has survived long after the seat of the originating cause has ceased to be painful. It is becoming lessened by the use of galvanism and frictions.

The woman has lost flesh since the accident; she sleeps poorly; the eyesight is defective. The left tibia is tender in the middle third, the leg is more florid, and the temperature higher. The left tibia is more sensitive than the right, and the tibial group of muscles shows a slight decrease to the faradic current.

Another instance is mentioned in which a shell-wound of one leg at once gave burning pain in both feet, in the right arm, and right pectoral region. In another case a wound of the testicle was referred to the back, where alone pain was felt. In a shell-wound of the left thigh the pain was referred to the same area on both thighs.

The author thinks it difficult to explain these symptoms, and especially the persistency of certain of these transferred impressions, for it is a law of the receiving centres that when the cause of the pain ceases the feeling of being hurt ends.

A Case of Dual Brain Action. (*Brain*, Part LXIX.) By Lewis P. Bruce, M.B.

The patient, a Welshman, aged forty-seven, appears to have two separate and distinct states of consciousness, the right and left brain alternately exerting a preponderating influence over the motor functions. These two mental conditions the author calls the English stage and the Welsh stage, because he spoke in each stage the language which is indicated by the name. When in the English stage he is right-handed and is presumably using the left cerebral hemisphere. He then writes, talks, and understands English, and appears to be the subject of chronic mania. He is restless and mischievous, but bold, fearless, and fairly intelligent. He writes fairly legibly with the right hand, and will, if asked, produce mirror writing (from right to left, making his letters backward) with his left hand. He does not remember anything that occurred when he was in the Welsh stage. His circulation is good and he seems healthy. His special senses seem unimpaired.

In the Welsh stage he is left-handed, and is probably using the right cerebral hemisphere. He speaks and understands Welsh but has no

knowledge of English. He is now in a condition of dementia. His mental and physical conditions are the reverse of the conditions of the English stage. He is shy and suspicious. He writes with the left hand and makes the capital letters backward. The special senses seem unimpaired, but he is unable to analyze and appreciate crude sensations. He does not seem to know coins or tobacco, of which he is very fond in the English stage. He cannot sort out the primary colors, is alarmed at the tuning-fork, and does not prefer sugar to salt. His circulation is weak and he seems very dull.

The direct cause of the transition from one stage to another the author thinks may be some circulatory change. Sphygmographic tracings of the radial pulse show a pulse of high tension when in the English stage and lower tension and less volume in the Welsh stage. The change from one stage to another may occur suddenly after a meal or a bath or during sleep, or there may be an intermediate stage. He is then ambidextrous and employs both English and Welsh words.

From these observations it would appear that in this person each cerebral hemisphere is capable of individual mental action, and he lives two separate existences, the mental impressions of each existence being recorded in one cerebral hemisphere only. Judging by the characteristic symptoms in this case, one inclines to the belief that even in health each cerebrum acted independently; and that disease has advanced more rapidly in the right hemisphere than in the left.

OPHTHALMOLOGY.

IN CHARGE OF CHARLES A. OLIVER, A.M., M.D.,
Philadelphia, Pennsylvania,

AND

EDMUND LANDOLT, M.D.,
Paris, France.

The Relation of the Function of Accommodation to that of Convergence. (*New York Medical Journal*, February 16, 1895.) By George T. Stevens, M.D., of New York.

As the result of the study of this subject during many years and from abundant material, Stevens arrives at the following important conclusions:

1. There is no essential connection between the function of convergence and that of accommodation; such connection as exists is incidental and the result of habitual association of the two functions.

2. The proportion of the cases of converging strabismus associated with hypermetropia, and of diverging strabismus associated with myopia, has been greatly exaggerated.

3. That the cases of strabismus which are relieved by positive or negative spherical glasses are cases of hypertropia,—that is, of a deviation of

one visual line above the other, or of a deviation of both eyes upward or downward,—and that the relief obtained through such glasses is largely through the action of such glasses and vertical prisms.

4. The author's observations have led him to believe that excessive accommodation is not directly a causative influence in converging starbismus.

Eye Cases in Chi-Nan-Fu, China. (Personal communication to Dr. Oliver.) By James B. Neal, M.D., Surgeon in charge of McIlwaine Hospital, Chi-Nan-Fu (Chefoo), China.

Dr. Neal writes: "The present list of eye cases includes only new patients, so that for the past year about one-tenth of our practice among out patients has been eye practice. Of the hospital cases just one-third have been eye cases. 1894 has not been a good year for practice here in Chi-Nan-Fu. Being the capital city of the Shantung Province, it has been more sensitive to the rumors connected with the present war than more retired places; so that, during the past six months especially, our practice has been much smaller than usual. We ourselves have been in no danger, nor do we anticipate any trouble hereafter."

Record of Eye Cases, Chi-Nan-Fu, China, July 1 to December 31, 1894.

Blepharitis.....	1	Pterygium	13
Conjunctival hyperæmia	15	Tumor of eyelid	1
Conjunctivitis, catarrhal	54	Trichiasis	12
" phlyctenular	5	Miscellaneous	17
" granular	22		
" purulent	6	Total for six months	271
Cataract, hard	7		
" soft.....	1	<i>Operations Included Above.</i>	
Corneal ulcer	49	Cataract, hard.....	2
" opacities	16	" soft	1
" staphyloma	1	Entropium	12
" inflammation	16	Enucleation of eyeball	1
Ectropium	1	Iridectomy	2
Entropium	12	Pterygium	11
Glaucoma.....	2	Tumor of eyelid.....	1
Intertrigo of lids	8	Trichiasis	8
Iritis, acute and chronic	12	Total	38

Treatment of Pupillary Occlusion by Extraction of the Transparent Crystalline Lens. (Traitement de l'Occlusion Pupillaire par l'Extraction du Cristallin transparent. Par le Dr. R. Jocs. *La Clinique ophtalmologique*, Fevrier, 1895.)—As the result of his experience in three cases, Jocs states that in complete pupillary occlusion complicated with total posterior synechia, we have no better operation than extraction of the crystalline lens. He also believes that during the operation it is best to extract immediately all that we can of the lens rather than trust to absorption, as after discission. He thinks that a well performed iridectomy offers the best possibility for the formation of a pupil.

OBSTETRICS AND GYNÆCOLOGY.

IN CHARGE OF RICHARD C. NORRIS, M.D.,

Lecturer on Clinical and Operative Obstetrics in the University of Pennsylvania; Physician-in-Charge, Preston Retreat; Visiting Obstetrician, Philadelphia Hospital; Gynecologist, Methodist Episcopal Hospital; Consulting Obstetrician and Attending Gynecologist, South-eastern Dispensary and Hospital for Women and Children.

Fibroid Tumor of the Uterus with Suppurating Ovary discharging per Rectum. (*Medical Record*, March 9, 1895.) By Rufus B. Hall, M.D.

This interesting case illustrates some of the complications which must be met in the operative treatment for fibroid tumors, and to these points the author directs attention.

Mrs. J. W., aged forty-four, had suffered with prolonged and excessive menstrual periods for five years, and later with pain in the back and a bearing-down sensation in the pelvis. Last February a fibroid tumor of the uterus was diagnosed and the usual treatment followed, with but little effect, for she gradually grew worse, and the latter part of April was confined to bed with an attack of peritonitis. After two weeks of severe illness several ounces of pus was discharged per rectum, which relieved her somewhat of the pain and fever. The discharge of pus occurred periodically until June 2, 1894, when she entered the hospital.

Examination revealed a tumor the size of a cocoanut, slightly to the left and some four or five inches above the symphysis pubis. Behind and to the right of the fibroid was a still larger elastic tumor, which was supposed to be a suppurating ovary. On June 6 the tumor was removed by total extirpation of the uterus. A large sac, closely adherent to the tumor, represented the suppurating ovary. On the lower part of the sac an irregular opening was found to communicate with the bowel. The omentum and intestine were adherent over the top of the tumor. A rent in the rectum just below the prominence of the sacrum was large enough to admit two fingers. After removal of the tumor very little of the peritoneum remained, and no attempt was made to close the vagina from the peritoneal cavity. The vagina was packed with gauze, the rent in the rectum was repaired, the pelvis was irrigated and packed with gauze, and, lastly, the sphincter ani was thoroughly dilated.

For nearly three weeks the high temperature, rapid pulse, and sweats continued, but at the end of that time the temperature became normal, and the patient rapidly improved.

In operating for a fibroid tumor associated with a suppurating ovary, the writer lays considerable stress on total extirpation of the cervix, which leaves a free communication into the vagina for subsequent drainage; on including a tag of the adherent tissue on suturing the rent in the bowel, so as to give more strength to the suture; on packing the pelvic cavity with gauze to keep the healthy intestine from the raw surfaces in the pelvis and

prevent adhesions; on forcible dilatation of the sphincter ani muscle, which causes incontinence and thus prevents pressure from accumulation of gases, this being especially useful in cases where there is a rent in the bowel.

Dangers of Massage of the Uterus. (*Société de Chirurgie.*)

The injurious effects of massage in suppurative lesions were shown by M. Pozzi by specimens from a case of metritis and double salpingo-ovaritis. On removal the tubes presented the appearance of pyosalpinx. There was a small purulent area outside of the left tube, which may have been caused by pus driven out of the tube by the manipulation. The left tube was found to contain blood, and the right a rose-colored pus. Rupture of the vessels and hemorrhage into the tubes were evidently the result of pressure during massage.

Suppuration of a tumor in the posterior cul-de-sac, causing the death of the patient, and painful symptoms in retroversion and slight ovarian affections, all occurring after massage, are reported by M. Bouilly.

The members all concurred in the opinion that the treatment by massage is an excellent one when suppuration is not present, and should be reserved for such cases.—*Universal Medical Magazine*, March, 1895.

Intramural Abscess Cavity filled with Gas and Purulent Material. (*American Journal of Obstetrics and Diseases of Women and Children*, March, 1895.) By A. F. Jonas, M.D.

Labor in which the right arm presented, necessitating version, was followed a month later by enormous enlargement of the abdomen, the circumference measuring forty-eight inches. On examination, a large mass was found, attempts to move which caused simultaneous movements of the cervix and the supposed fundus. A cystoma with infectious contents was diagnosed and an operation performed. A trocar was introduced into the tumor, and on withdrawal a large quantity of fetid gas rushed out, which reduced the tumor nearly one-half, and was followed by very thick purulent material which contained broken shreds and sloughing tissue. The fundus uteri, ovaries, and tubes were found forced low down in the pelvis and free posteriorly, but anteriorly the uterus was attached by its entire surface to the wall of the cystoma, which was located between the bladder and the uterus. There was no connection with the uterine cavity.

The origin of the abscess was in the anterior uterine wall, and it gradually separated the muscular layers as the quantity of pus increased. Suppurative processes in muscular structures usually produce liquefaction unless a capsule such as would surround a neoplasm is present. A small fibroid was found in the posterior wall, and, since fibromata are frequently multiple, it is not improbable that one existed encapsulated in the anterior wall. An existing intramural fibroid subjected to long-continued pressure, such as would occur in pregnancy, becomes more or less bruised, and is in excellent

condition for microbic infection, development of suppuration, and distention of the cavity with gas, the product of microbic action. So large a quantity as was found in this case is extremely rare.

PATHOLOGY.

IN CHARGE OF ALLEN J. SMITH, A.M., M.D.,

Professor of Pathology in the Medical Department of the University of Texas, Galveston, Texas,

AND

HENRY W. CATTELL, A.M., M.D.,

Demonstrator of Morbid Anatomy in the University of Pennsylvania; Prosecutor to the American Anthropometric Society; and Pathologist to the Presbyterian Hospital, the Institution for Feeble-Minded Children at Elwyn, etc.

Melanotic Cancer of the Fingers. (*Archives cliniques de Bordeaux*, October, 1894.) By Charles Faguet, M.D., of Bordeaux.

The writer records the occurrence of the above-named disease in a woman seventy-nine years of age. A splinter of wood run into the middle finger of the left hand had caused a paronychia which left a swollen suppurating point. Two years later, in April, 1893, a small black spot appeared at the point of suppuration, which rapidly involved the tissues, so that by the month of July all of the soft tissues on the phalanx were destroyed. On November 5, when she applied for treatment, the terminal phalanx was completely destroyed, and the finger terminated at the level of the inferior extremity of the phalanx in an irregular, blackish ulcerated tumor with everted edges and an ichorous purulent discharge. Lancinating pains exaggerated by pressure were felt. The surrounding tissues were infiltrated, and only limited movement was possible at the level of the metacarpo-phalangeal articulation. Examination of the arm, axilla, and clavicular region revealed three or four indurated axillary glands. These glands were removed and the metacarpo-phalangeal joint disarticulated. The patient was well and able to leave the hospital on December 2, 1893. The disease had not returned in October, 1894.

On examination the tissue of the second phalanx was found to be infiltrated and pigmented, the cartilage was irregular and friable, and the periosteum was involved. The metacarpo-phalangeal joint was healthy. The axillary glands were either of firm tissue, tinted uniformly or in patches, or of a soft black pulp. A portion of this soft tissue was inoculated subcutaneously into a rat on November 16. The animal died on the evening of the third day of septicæmia. A detailed account of the histological examination of the tissues of the tumor and of the glands is given. The writer has collected eight cases of melanotic cancer of the fingers, and he gives the history of each. From the study of these cases he concludes that the primary melanotic tumor of the fingers presents itself in three forms:

1. The carcinoma, which is characterized by large, pale, flattened cells very irregular in form, generally elongated or fusiform, and very much pigmented. These cells have a large nucleus which contains from one to four very bright nucleoli. At other points in the tissue small round cells are found which resemble the cells of embryonal sarcoma. The blood-vessels are more or less numerous and have a proper wall. The cuticle is infiltrated with cancer-cells, but the epidermis resists involvement for a long time. The periosteum is rapidly involved, but the osseous tissue preserves its integrity for a long time. The epitrochlear and axillary glands are quickly infiltrated by the cancer-cells and the melanotic pigment. The melanotic granulations are more or less confluent and may entirely obscure the anatomical elements. 2. The sarcoma, which is characterized by oval or fusiform cells united in masses or bundles and usually very much pigmented. The blood-vessels are numerous and without proper walls. 3. A mixed form of tumor in which both of the other forms are united.

Simple Method of Detecting Bile-Pigment in Icteric Fluid. (*Upsala läkareförenings förhandlingar*, vol. xxix., Nos. 7, 8.) By Israel Hedenius, M.D.

To about five cubic centimetres of the serous fluid add twice or three times its volume of concentrated alcohol and shake the mixture. Add as many drops of hydrochloric acid (10 to 25 per cent.) as will be required to dissolve the precipitation caused by the addition of the concentrated spirits, when the fluid will become clear. Bring the fluid to a boil, and if gall-pigment be present a blue-green color will appear within a minute or so. In a serous exudation containing only one part of bilirubin to two hundred and fifty thousand parts of fluid the blue-green color became very conspicuous. When it is desired to ascertain the presence of an insignificant quantity of the coloring matter of the bile in concentrated fluids rich in albumin, the author proceeds as follows: To three or four centimetres ($\frac{3}{4}$ to 1 fluidrachm) of the fluid add four or five times its volume of concentrated spirit, which will cause the precipitation of all the proteid substances present. Shake well several times and filter the fluid. Add several drops of hydrochloric acid and boil, when, if gall-pigment be present, a delicate blue-green color will appear in the fluid.

To test the blood, precipitate two to four cubic centimetres ($\frac{1}{2}$ to 1 fluidrachm) with the aid of ten to twenty cubic centimetres ($2\frac{1}{2}$ to 5 fluidrachms) of concentrated spirits, and shake well several times. To ten cubic centimetres ($2\frac{1}{2}$ fluidrachms) of the percolated fluid add about five drops of hydrochloric acid (preferably 10-per-cent. strength) and boil. The blood must be fresh, and frozen blood should not be used. In order to make the reaction perfectly plain the blood must contain not less than one to fifty thousand bile-pigment. As to the urine, it is important that this be diluted with at least four volumes of concentrated spirits.—*Universal Medical Magazine*, March, 1895.

FORENSIC MEDICINE.

IN CHARGE OF LORENZO D. BULETTE,
Of the Philadelphia Bar.

COMPARATIVE RESPONSIBILITY OF THE CONSULTING AND ATTENDING PHYSICIAN.

THE comparative responsibility resting upon the attending and the consulting physician or surgeon for the results of their treatment frequently becomes a question of importance for determination. And the degree of responsibility that should, under the circumstances of the case, attach to each depends necessarily upon the relation in which the consultant places himself towards the patient.

Says Ordonaux,¹ in his usual perspicuous style, "If he be called in but once, and for the purpose of counselling alone, it is clear that his contract and responsibility both terminate with his visit. He is subordinated to the attending surgeon in the application of whatever treatment he may direct, since the latter, by adopting it, both indorses it and makes it his own, and, still retaining the exclusive management of the case, retains the right to apply the advice according as his own judgment shall direct, for the advice might be applicable to-day and not so to-morrow. But if the consulting surgeon be called in for the purpose of performing an operation, and does perform it, he gives a new direction to the case, and becomes responsible for the immediate effects of such operation. When, however, he has handed over the case, at a safe stage of its treatment, to the attending surgeon, his responsibility clearly ceases. If, on the other hand, being originally called in to counsel, the consultant consents to undertake the treatment of the case in connection with the attending surgeon, he thereby constitutes himself a principal in the transaction, while the latter acts as his agent, and, upon the general principles regulating this relation, he becomes responsible for that agent's treatment wherever those results flow directly from the legitimate exercise of his duties."

As between the physician and surgeon, while the same rule of law imposes the duties and prescribes the qualifications that each must bring to his task, the number of actions against surgeons alone is far in excess of the number brought against physicians for malpractice. Failure is rarely excused in the surgeon; and the reason is apparent in the fact that the

¹ Jurisprudence of Medicine, p. 101.

results of the surgeon's work are patent,—the scars and deformities are remembered, while the good intention, the care, and skill exercised in the performance of a difficult operation are ungratefully forgotten.

But where there is negligence which cannot be personally apportioned between a surgeon and physician acting on an equality in the treatment of a case, they are jointly liable; and an example of what will constitute a joint liability between a consulting and an attending physician is found in the facts of *Slater vs. Baker and Stapleton*,¹ the earliest reported case of an action for damages for surgical malpractice.

The plaintiff had broken both bones of one leg, but the fracture had been set, the callus had formed, and he was able to walk with crutches. At this juncture, S., who was an apothecary, was sent for to remove the bandages; but, declining to act alone, he requested that Doctor B. be called in to assist him. Doctor B. was an eminent surgeon, and a lecturer on surgery and anatomy in St. Bartholomew's Hospital in London. It also appeared in evidence that the third time the defendants called to see plaintiff, Doctor B. took up the plaintiff's foot in both hands and nodded to S., and then S. took the plaintiff's leg upon his knee, and the leg gave a crack, when the plaintiff cried out and said, "You have broke what nature had formed." Doctor B. then said, "You must go through the operation of extension;" and S. said, "We have consulted and done for the best."

After trial and a verdict for the plaintiff for £500, it was, on motion in arrest of judgment, objected on behalf of the defendants that, inasmuch as both defendants were joined in the same action on the theory of a joint liability, it should be proved, but that there was no evidence of a joint undertaking. The court were, however, of the opinion that the facts as here stated constituted sufficient evidence of the joint liability of the defendants, and their motion was accordingly denied.

BOOK REVIEWS.

A MANUAL OF DISEASES OF THE EAR, FOR THE USE OF STUDENTS AND PRACTITIONERS OF MEDICINE. By Albert H. Buck, M.D., Clinical Professor of Diseases of the Ear, College of Physicians and Surgeons, etc., New York. Second Revised Edition. New York: Wm. Wood & Co., 1895.

This is a handsome, well-written, compact book. The chapter on General Diagnosis, running from page 1 to 25, is most excellent for a specialist, but we fail to see how the general practitioner can help himself in diagnosis by using, or attempting to use, the ear-mirror and speculum. The proper use of these, like that of the tuning-

¹2 Wilson's Rep. 359 (1767).

fork, presupposes special instruction and acquired facility. All forms of probes and metal instruments should never be used in the ear, except by a specialist. The only painless and safe way to remove collections of wax from the ear is by means of the syringe. Even the latter needs gentleness in its use as well as some experience.

The chapter on Analysis of Symptoms is a new one, and of most worth to the general practitioner.

We regret that we must differ with the author regarding the treatment of eczema of the auricle. In this disease anywhere in the body a fundamental element of success is not to use soap and water, or water alone, for the removal of crusts and scales from ulcerated spots. It always makes the disease worse. The burning, itching, and pain may be relieved by mopping the eczematous surface with black wash, allowing the grayish pellicle to remain until it falls off. Or, the broken region may be protected by a powder of oxide of zinc and starch. Sheathe such surfaces as you would a burn of the skin. We are glad to see that regarding incision of furuncles in the ear, the author is conservative.

The chapter on Diffuse Inflammation is very good on the whole, though we fail to find any efficient remedy for the destruction of aspergillus in the ear.

Respecting foreign bodies in the ear and their removal, the author's directions are judicious; though no one but a specialist should employ any instrument but a syringe for their removal. Insects may be smothered with sweet oil and then syringed out. In most cases even the aurist will do well to rely on the syringe for the removal of foreign bodies from the ear.

Diseases of the middle ear are well described, and for the most part the treatment advised is judicious. But this chapter is valueless to the average general practitioner, as he can do nothing for the relief of such maladies. Good advice is given on page 172, to always regard an "earache," for it is never a trivial circumstance.

Acute middle-ear inflammations are accurately described, but the treatment, both before and after spontaneous rupture or paracentesis of the membrana, by means of hot water, poultices, and similar moist methods, is septic, especially after discharge from the ear sets in, and leads to secondary infection and inflammation of the tympanic cavity.

Intratympanic operations are now constantly employed with great success for the relief of both the lesions of chronic catarrhal otitis media and of chronic purulency from the ear. Especially in the latter malady, timely excision of necrotic ossicles improves drainage from the ear, cures the otorrhœa, and thus wards off mastoiditis, sinus-thrombosis, and cerebral abscess, and we regret that the author has rendered his book of less value than it would be if these operations were explained and indications given for their employment, instead of being dismissed with a few words (p. 306).

The elaborate chapter on Mastoid Disease and its Treatment would not need to be written, if in all cases the original acute otitis was properly—that is, aseptically—treated from the outset. And the best way to do this is to put absolutely nothing into the ear, especially after discharge sets in, excepting a short filament of carbolic-acid gauze or iodoform gauze, to favor outward drainage. If this rule is observed, the middle ear and the mastoid antrum and cavity will empty themselves siphonically, by way of the meatus externus, and all discharge cease in four or five days. But syringing, mopping the fundus of the canal, or insufflating powders into it, conveys septic matter to the membrana and middle ear, clogs the perforation in the former, secondary tympanitis may be set up, and the patient is then likely to suffer from a secondary retention mastoiditis. Unless empyema is confined to the mastoid cavity, mastoid operations are in the field of general surgery, because, with the above exception, they are but the preliminary to deeper cranial or cervical operations.

C. H. B.

A MONOGRAPH ON DISEASES OF THE BREAST; THEIR PATHOLOGY AND TREATMENT, WITH SPECIAL REFERENCE TO CANCER. By W. Roger Williams, F.R.C.S. With seventy-six figures. London: John Bale & Sons.

This is an octavo volume of 572 pages, with a sufficient number of carefully-selected illustrations. It is divided into twenty-five chapters. The first four embrace the development and variations of the gland; the fifth is on hypertrophy; the sixth and seventh on histology, with the varieties of mammary neoplasms and their frequency. Chapters eight to thirteen, inclusive, are devoted to scirrhus carcinoma; chapter fourteen, to so-called villous duct cancers; fifteen, to cancer of the mammary integument (Paget's disease, etc.); sixteen, cancer of the male breast; seventeen, sarcoma; eighteen, fibroma and fibro-adenoma. Lipoma, chondroma, osteoma, angioma, papilloma, and cystic diseases are then treated. Chapter twenty-two is devoted to axillary tumors; chapter twenty-three, to inflammatory and suppurative diseases; and the remaining two chapters to tubercle, syphilis, diphtheria, traumata, neuroses, and minor surgery.

As will be seen from the above synopsis the subject is well covered. The author writes from the stand-point more of a disinterested observer than that of an active participator. The material at his command as surgical registrar added to that which he has gathered by his own industry, judged in the calm, dispassionate, scientific manner of one who has no selfish ends to advance, no pet theory to establish, and no favorite operation to advocate, have all combined to enable him to draw conclusions which should command the careful attention of the profession. It is safe to say that a work like the present, composed as it is on these lines, will take its place as one of the standards on the subject of which it treats. It is written from the stand-point more of a pathologist than that of a practical surgeon, yet the scientific facts are considered in relation to their bearing on the treatment of the affections described. The advanced surgeon would probably hold that the aseptic method of treating excision of the breast was more entitled to description than the antiseptic one which the author gives, but even he will not fail to thank him for calling attention to the fact that the gland is tricuspid and not round in shape, and pointing out the spots of affected tissue which are most apt to be overlooked in operative procedures. He describes his complete operation in which the whole breast is removed, together with the overlying skin and the underlying pectoral fascia, followed by clearing of the axilla. Cancers affecting the ducts, instead of the acini, are carefully considered, but we still appear to have no reliable means of distinguishing them from the benign intra-canalicular affection. The author considers that Paget has greatly over-estimated the frequency with which the disease bearing his name is followed by the development of carcinoma. The affection described by Duhring and Thin is considered different from that described by Paget and Butlin. The latter was associated with cancerous disease of the acini, while the former involved the ducts; thus the one was a scirrhus while the other was a tubular carcinoma.

Careful attention is paid to the treatment of the various growths as well as the inflammatory affections. The volume is full of most valuable illustrative clinical cases, is free from any marked typographical errors, and is written in a charming style.

G. G. D.

SURGICAL PATHOLOGY AND THERAPEUTICS. By John Collins Warren, M.D., Professor of Surgery in Harvard University. Philadelphia: Wm. B. Saunders.

It is a matter of the greatest satisfaction to us that an American surgeon has produced a work upon surgical pathology and therapeutics, which, in our judgment, will be received with as much appreciation and will take as high a rank as did those of Paget and Billroth on a kindred subject. Recent investigations in bacteriology have rendered the older standard works on surgical pathology practically

useless, and, in view of this fact, we find that Dr. Warren has wisely devoted much space to the consideration of bacteriology and surgical bacteriology, subjects which are at the present day so intimately associated with the practice of surgery that no one could expect intelligently to practise the science and art of surgery without a full understanding of these subjects.

The reader cannot fail to be impressed with the fact that the author has sifted *carefully the matter* before him, and has selected that which is most modern in surgical pathology, but at the same time he gives due credit to that which has remained unassailable in the older pathology.

The articles upon Inflammation, Infectious Inflammation, Process of Repair, Tuberculosis and Surgical Tuberculosis of the Joints, Septicæmia, and Pyæmia are especially worthy of the most careful study.

We can, after a careful study of the work, recommend it most highly, and are sure that every one who has to solve the problems of surgery will be better prepared for their solution by a careful study of its contents, and we predict for Dr. Warren's work a high place in surgical literature.

The typographical work is excellent, as well as the illustrations, many of which are works of art, and we think the publisher should also be congratulated upon a very beautiful piece of book-making.

H. R. W.

A TREATISE ON THE PRINCIPLES AND PRACTICE OF MEDICINE. By Austin Flint, M.D., LL.D. Seventh Edition. Revised by Frederick P. Henry, A.M., M.D. Philadelphia: Lea Bros. & Co., 1894.

Contrary to the usual rules of mental conservatism of the aged, no more striking indication of the possible catholicity and receptivity of the mind, even long after the mental mould is usually set, was seen than in the attitude of Flint in New York and Agnew in Philadelphia towards modern medicine as exemplified by bacteriology and the whole *régime* of antiseptics. Flint was the earliest of the clinicians to accept and urge the truthfulness of the views of Koch regarding tuberculosis, while Agnew, veteran and hero, with victories galore, turned aside to weigh and then employ the system of antiseptic surgery. Flint's death occurred at the dawn of modern medicine. The last edition of his great work marked the passing of the old. The era of objective medicine was opening. v. Jaksch's pioneer work appeared half a decade later. Subjective medicine was fading; objective medicine was illumining the horizon. Since the last edition bacteriological diagnosis has grown to be essential; the powers of the microscope have been expanded; substantial advances from an objective stand-point have been made in the clinical study of the blood and nervous system; marvellous strides in gastric diagnosis have been taken; and, all in all, clinical medicine and clinical diagnosis have approached an exactness bordering upon the scientific.

Manifestly, then, the editor of the new edition had a most difficult task. He dare not destroy the old, or it would not be "Flint." He dare not varnish it over, for to do so would be to efface the matchless word-pictures of disease only the master could paint. It is true the day has come when such portrayals are not so essential. Flint without them would be the wine without the bouquet, the rose without the fragrance.

That the editor has judiciously retained the old and harmoniously blended with it the new, an examination of the work readily shows. New articles have been added, marking the progress since the last edition, and the subject of gastric diseases has been almost entirely rewritten. Space forbids a critical examination of the contents of the well-printed volume. The high standing, the well-known accuracy in scientific work, and the conservatism of the distinguished editor bespeak for the new matter clinical truthfulness, which cannot but be the only guide for the practitioner and student. The publishers are to be congratulated upon securing his services for the—without doubt—most agreeable task.

J. H. M.

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ORIGINAL COMMUNICATIONS.

A CASE OF ABSCESS OF THE BRAIN, WITH REMOVAL OF A CEREBRAL HERNIA.

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THE case I desire to present is one of a great many that are treated expectantly, because all the train of symptoms of depression and inflammation of the brain are not exhibited at the time of the injury. It is a fact long since demonstrated that a compound fracture of the skull with a depression or with a laceration of the coverings of the brain demands immediate operation, in order to prevent the train of symptoms which would certainly follow a wound opening into the brain, affording, as it does, an entrance for germs which are sure to produce inflammation. Still there is a class of men who have not yet awakened to the true state of affairs, either through lack of judgment or timidity. This is not a time when a patient should be allowed to die from an injury, however far he may be removed from a well-regulated hospital. The surroundings outside, though not of the best, can be improved upon until they surely offer better prospects to the patient who has been operated upon than to one who has not. It is folly to wait until the inflammatory process is already set up before attempting an operation. If an operation is indicated at all, why not perform it at once, and thus diminish the suffering of your patient and rid him of the danger of septic infection? The loss of brain substance, in whatever portion of the brain, certainly impairs the integrity of that organ. Sooner or later epilepsy or insanity may follow, and for the brain to lose its function is for the patient to become a useless imbecile. The fact that the brain has been known to withstand the ravages of a purulent inflammation,

laceration from a crow-bar, and the removal of a cerebral hernia, does not argue that a foreign body, so situated as to become a medium of infection, should be left in the organ, or that an injury impairing the integrity of the organ should be treated with ice-packs and bromides. Still there are men in the profession to-day who will hold up their hands and say, "Wait a while; try cold or some other agent," equally ineffective or delusive. Then these men will cite the American crow-bar case and others that are familiar. Do not let this example deter you from performing the duty you owe to your patient and to science. I would not say make every case that comes within your grasp a stone with which to build your reputation,—far from it; but, in the interest of humanity, do not become imbued with that cowardly kind of fear that prevents you from performing a reasonable duty. Be honest with your patient, be true to yourself; do for him that which, in the light of the present, your judgment approves.

Samuel J., an American, aged sixteen, by occupation a coal-miner. The patient was in good health up to the time of injury. On September 3, 1891, he was loading his car with coal, when he was struck on the back of the head by falling slate, forcing his head down upon a bolt at the corner of the box, which caused a laceration of the scalp and a compound fracture of the frontal bone above the left orbit. He left the mine and walked some distance to his home. A physician was called, who stitched up the external wound. In a few days the patient was out, but complained of his head aching on receiving any sudden jar or on exposure to the sun. He continued in this condition for several weeks, when he gradually grew worse, and was confined to his bed, the symptoms gradually assuming greater gravity.

I saw him for the first time November 20, 1891, seventy-nine days after the injury. The pulse was then 58 per minute; temperature, 101.4° F.; respiration, 23; he complained of chilliness, of pain in the back of the head, and answered questions reluctantly. There was no paralysis. The wound in the scalp had never healed. I discovered the fracture by palpation, diagnosed abscess of the brain, and advised an immediate operation, but consent was refused. On November 22, I was summoned by messenger, saying that the patient had had a convulsion and an operation was desired. At 2 P.M. the pulse was 96 per minute; temperature, 102°; respiration, 23; pupils unequally dilated and did not respond to light. The patient was profoundly comatose. He was hurriedly placed on the table, the old wound was enlarged, and a perpendicular incision made. The flaps were turned back, which exposed two lines of fracture, beginning three-quarters of an inch to the left of the median line and one inch above the arch of the orbit, and extending one and one-eighth inches in length and three-quarters of an inch in breadth. A piece of bone was found driven into the brain substance. This fragment could not be removed with the elevator, and the trephine was applied on the upper edge of the fracture, one inch from the median line. On removal of the button of



1.—Patient after formation of the cerebral hernia.



FIG. 3.—Patient after recovery.

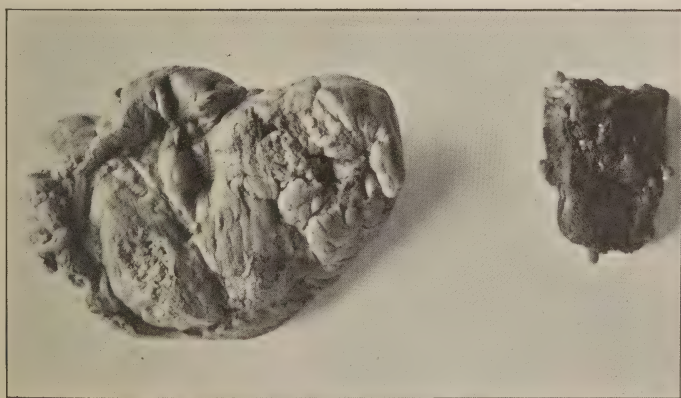


FIG. 2.—Hernia and fragment of bone.

bone the pulseless dura bulged into the opening. The opening was further enlarged by the removal of several fragments, and an irregular-shaped piece of bone weighing sixteen grains was then removed. This fragment shows a more extensive fracture of the inner than of the outer plate. At this juncture chloroform narcosis ensued, and the patient's head was lowered, whereupon the abscess emptied itself of about three ounces of pus. The edges of the bone were now smoothed, the *débris* removed, the wound irrigated, drained, closed, and dressed with sublimate gauze.

November 23, pulse, 86; temperature, 99.80° ; respiration, 22; patient conscious; no pain.

November 24, pulse, 89; temperature, 100.60° ; respiration, 28; complains of pain in the head, wound discharging pus, edges of the integument tense from the pressure within. The wound was irrigated and a compress applied.

November 25, pulse, 84; temperature, 100.40° ; respiration, 26. The patient still complained of pain; a hypodermic of morphine was given him and a compress again applied.

November 26, pulse, 88; temperature, 100.40° ; respiration, 28. The patient rested badly during the night, pain in the head was more severe, and there were nausea and vomiting. Symptoms of depression were developing, and the compress and sutures were removed and the hernia was allowed to form (see Fig. 1). Iron was given freely, and the patient gradually improved.

On January 11, 1892, the hernia was removed in the following manner: A needle carrying a double thread was passed through its base. Each half was ligated separately, the hernia excised (see Fig. 2), and the wound closed. The muscles of the upper eyelid had been pressed upon so long that when they were again brought into action they allowed the lid to droop. Later the adhesions were broken up and the lid was raised until it was out of the line of vision. The patient was discharged on February 11, 1892; the wound was entirely healed, and there was no apparent sign of mental derangement.

Subsequent examination, June 23, 1893. The patient's health is good; the scar is not so plain (see Fig. 3); the memory is not quite as good as it was before the injury, but it seems to be a fair average.

TREATMENT OF TUBERCULOUS AFFECTIONS OF THE KNEE-JOINT.

BY HORACE MANCHESTER BROWN, M.D.,

Of Milwaukee, Wis.

(Concluded from April number, page 177.)

ANCHYLOSIS.

A CERTAIN percentage of cases recover either spontaneously, after the formation of points for escape for the products of degenerative change, or after incision, disinfection, and drainage, with more or less ankylosis. In endeavoring to break up the ankylosis, an important question to be answered is, as to whether the adhesions are intracapsular or extracapsular, and when the time shall have arrived when it will be safe to take the risk of starting anew the tuberculous process by the irritation to the joint which will follow the forced rupture of the adhesions, in the effort to re-establish motion in the joint. The history of the case as to whether there has or has not been an intracapsular distention will answer in the majority of cases the first of these questions.

The solution of the second problem will be best found in the condition of the improvement or non-improvement of the patient's general condition.

Under any circumstances delay sufficient to give reasonable assurance of definite arrest of the tuberculous process is to be recommended. It is a rule to which there should be no exception that any forcible manipulation of a joint that has been the seat of tuberculous disease should never be thought of.

Under any circumstances too much care cannot be exercised, in the effort to break up the adhesions to establish a certain amount of motion in the joint, to avoid the possibility of producing a fracture either in the joint or in the leg of one of the involved bones, and therefore it is better, perhaps, first to attempt, without an anæsthetic, to break up adhesion, so that, in the slight motion it is possible to produce, one may acquire a comparatively definite idea as to the exact nature of the joint adhesions and the exact quality of the intracapsular structures. Afterwards, the patient being anæsthetized, a more complete effort may be made to re-establish motion in the limb. Of course, after arthrectomy, arthrotomy, or excision of the joint, complete and definite ankylosis must be expected. And it will be found that only in extremely rare and exceptional cases, even after a partial arthrectomy, can any amount of motion be developed in the limb. After iodoform emulsion injections, when the original disease seems to be definitely terminated, passive motion and a prolonged course of passive gymnastics and

massage may be efficient in developing anew a limited amount of motion in the joint.

TUBERCULAR HYDRARTHROSIS.

In regard to the treatment of this condition, experience has taught that the state of chronic inflammation or infiltration of the synovium is the result of the irritation of the presence of the tuberculous process, and treatment in the direction of its relief should be with the idea of destroying tuberculous germs in the tissues of the synovium as well as in the collected fluid.

The use of blisters, as well as inunction of mercurials, in conjunction with rest, have been found to yield good results; but it should be remembered that it is this particular form of the disease which is most amenable to drainage, washing, and injection, and particularly most amenable to the curative action of iodine and iodoform when applied directly to the inflamed synovial tissue; therefore the expectant form of treatment should not be followed.

When the disease is of long standing, and an improvement of nutrition does not improve the local condition, something more is requisite. Under such circumstances the fluid should be removed from the distended parts, and an effort made by means of injection of the joint to bring about thickening of the capsular support, coagulation and hardening of the fibrin, and destruction of bacilli.

For this purpose a solution of carbolic acid, one in forty or one in sixty, equal or nearly so to the amount of fluid withdrawn, may be injected into the joint by means of a fountain syringe, and this application repeated until the solution returns from the joint free from any cloudiness or opalescent discoloration. When the synovial membrane and the synovial fluid seem to be free from any inflammatory products, the joint should be injected with a five-per-cent. iodoform emulsion in ether or glycerin, and the massage of the joint employed so that the iodoform shall be distributed throughout all the sinuosities and diverticula of the synovial sac. While this kneading and massage is being carried out, the limb should be maintained in a position of extreme tension, and by this means the greatest facility of distribution of the iodoform is obtained.

HYDRARTHROSIS.

After the trocar is withdrawn and the wound covered with an antiseptic dressing, the patient should be put to bed, and the limb be supported on a posterior splint, and *slight extension applied* from eight to twelve days. During this time the leg should be bandaged with an evenly-supporting dressing applied over plenty of cotton, and at the expiration of the time passive motion should be commenced, provided there has been no serious return of the fluid to the synovial sac. After the lapse of two or three days the patient may be allowed to use the leg, and short excursions may be attempted. It is of great importance that the leg be not confined in the

immovable dressing for too long a time, lest there should be adhesions and partial ankylosis, or too great thickening of the capsule.

This operation is accompanied with but little pain, and in my hands has in four or five instances proved very satisfactory. Poore reports three cases as having been carried to a satisfactory result by this method of treatment.

PROGNOSIS.

The prognosis in cases of tuberculous disease of the knee-joint is invariably bad, and at no time, from the commencement of the pain and other symptoms about the joint until there shall have been evidence of complete cicatrization, is the surgeon safe in giving a favorable opinion as to what shall be the result. This must be evident from a consideration of the general pathological condition of the patient, as well as the local condition, and, no matter how slight an injury about the knee-joint of a child of tubercular appearance may have been, should the pain and soreness not subside within two or three weeks after the injury, the limb having been placed in a position best calculated to secure rest, the surgeon should give it as his opinion that there is some great pathological process taking place either in the tibial or femoral epiphysis or in the joint itself, and that the outlook for perfect and complete use of the limb is extremely doubtful. In no class of cases have we to deal with a more serious diseased condition than in the tuberculous disease of the knee-joint. Its unusually extended synovial surface, its unusual importance in the economy, its position in a limb made of long bones which act as levers, utilizing the knee often as a fulcrum, the large and complicated mass of muscles which surround the knee-joint, and the multiplicity of the functions which the knee-joint is called upon to perform in the various acts of life, render its disease perhaps one of the most important of all which flesh is heir to.

Therefore, all opinions should be most guarded, and the patient and his friends given to understand the importance of the event, and the smallness of the possibility of a restoration of function to the limb. From the use of general remedies but little is to be hoped for as far as modification of the local disease is concerned, or from an improvement of hygienic conditions. It has been shown that in the majority of instances resort must be made to the knife. That progressive metamorphosis of the tuberculous tissue can be brought about by an improvement of the general condition alone is extremely doubtful, and except in a limited number of cases which are seen early, and in which a diagnosis is made before there has been any intracapsular disturbance, it cannot be hoped that cicatrization will take place. At the outset a stiffened knee is to be expected, and in the majority of cases if a patient recovers with an ankylosed knee-joint which will be useful to him, as well as of cosmetic value, he may be congratulated as to the result; and although there have been cases in which a greater or less amount of motion has been secured in the joint after an arthrectomy or an arthrotomy, such a result is rather an exception than the rule, and no promise

of such a result should ever be given to a patient or to a patient's friends. The injection of the iodoform emulsions in ether or in glycerin have, perhaps, been productive of the most satisfactory results as far as maintenance of partial movement in the limb is concerned. But it is only in an exceptional number, a very small number, of these cases that such results have been produced, or that such results can be expected. Partial arthrectomies, a laying open of the joint, and excision of that portion of the synovial membrane which has already undergone pulpy and granular degeneration, has proved a success in a few instances; but even a measure of that kind is not to be depended upon, even in the cases where there is but partial destruction of the synovium, and in which there are only islands of velvety granulation tissue instead of a general pulpy degeneration of the synovial membrane. In my own hands such a case has recovered with motion limited to about half the normal; but in that case the patient was exceptionally sensible, and the line of treatment was carried out absolutely systematically, and with the very best possible conditions existing for a good result. Excision of the joint and arthrotomy have often proved more valuable, inasmuch as a more satisfactory surface is produced by these operations for the production of an ankylosis in a line of election.

In calculating the probabilities of a successful result after operation, as well as in preparing ourselves to give our opinion to the patient or friends as to the advisability of any form of treatment, many factors must be considered.

It has been the experience of those who have done the most in the operative treatment of these cases that extreme anæmia and a waxy appearance of the skin are indications of a more or less complete infection. (Senn.)

The existence of a diarrhoea, a distended abdomen, the presence of inflammatory activity in other joints, the evidence of skin tuberculosis, or of pulmonary involvement, are all factors, the value of which should be well considered before so serious an operation as arthrectomy or arthrotomy is undertaken.

To sum up the points which it is desired to emphasize in this paper one may say,—

1. That tuberculous disease of the knee-joint calls for treatment, the principle upon which that treatment depends being the same as that for any other condition in any part of the body in which there is existing as an exciting cause a microbic infection which is capable of producing either local or general retrograde metamorphosis of tissue.

2. It is also essential that the general condition of the patient in this disease should receive the most careful attention, inasmuch as the tendency of the disease, affecting as it does the largest joint synovial surface in the body, is towards rapid production of general sepsis, and rapid diminution of general resistance to septic infection.

3. That, while the contents of the knee-joint after perforation from a

caseous focus in the epiphysis of the femur is not true pus, but, on the contrary, broken-down tissue containing tuberculous matter, there may at any time take place an infection of the joint from the development of staphylococci or streptococci, which may produce a general septicæmia.

4. All hope of successful treatment with the idea of preventing retrograde metamorphosis of tissue after a tuberculous infection has taken place in the bone will depend upon extremely early diagnosis, operations, rest, and improvement of the hygienic conditions.

5. All pus collections, wheresoever they may form as the result of infection of tuberculous material with pus cocci, should be evacuated, drained, disinfected, and curetted.

6. Early operation is indicated upon tuberculous abscesses occurring in the ends of the bones, and suspicion should be attached to any continued pain in the epiphyseal region in children after injury which does not disappear after a few weeks of rest.

7. Immobilization of the knee, but not by means of plaster dressings, is indicated in all suspicious cases of osteitis occurring in the neighborhood of the joint.

8. An attempt should always be made to bring about progressive metamorphosis of tissue by injections of iodoform emulsions either in glycerin or ether, when the progress of the disease has not been so great as to indicate that the intracapsular tissues are entirely destroyed.

9. Arthrectomy and arthrotomy are contra-indicated in cases where excessive emaciation and extreme anæmia, or the occurrence of foci of tuberculous disease in distant organs, indicate that there is a general condition of tuberculosis.

10. Arthrectomy or arthrotomy is indicated when the disease seems to be limited to the joint or the pericapsular tissues, and when the patient's condition is such that it is safe to believe that the shock of the operation can be withstood. Great care is to be exercised in attempting to break up an ankylosis, lest the disease, not entirely eradicated, be started anew, or new fractures be produced.

11. Amputation is indicated when the disease shows no tendency to local improvement, and the progress of the disease is rapid and unmanageable, as in the liquefying form of tuberculosis.

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ARTERIO-SCLEROSIS.

BY FRANK BILLINGS, M.D.,

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ARTERIO-SCLEROSIS, known also as endarteritis chronica, deformans arterio, capillary fibrosis, and atheroma, is a chronic degenerative and inflammatory disease of the vascular system, with secondary degenerative changes in other organs. Gull and Sutton were the first to describe it as an independent affection.

The disease may involve the arteries alone, or it may involve the veins and capillaries as well. It may be local or general in its manifestations, be confined to the aorta or to the whole arterial system. Involvement of the pulmonary system is rare, and always secondary to lung- or heart-disease.

Arterio-sclerosis is essentially a disease of old age and is rarely found before the age of forty. I have heard Nothnagel say that arterio-sclerosis occurring before the fortieth year was always due to either syphilis or nephritis. It is true, as Sydenham said, that "a man is only as old as his arteries," and a man at forty-five may present arteries as degenerated as another man at seventy or eighty years. This is doubtless due in many instances to a family inheritance of a want of vital resistance, to the physiological process of evolution of advancing years, or to the toxic conditions of the blood from alcoholism, gout, rheumatism, syphilis, chronic plumbism, chronic nephritis, etc.

The disease does not occur in all cases of toxæmia from the above-named diseases, and it is rational to believe that there must be some condition of tissue weakness which allows the poison to produce the characteristic changes in certain individuals.

A vicious life of over-indulgence and hypertoxæmia from alcoholism, overeating, etc., may, it is true, produce early degenerative changes in vessels of good material. The abuse of food by overeating or gormandizing, or by eating less but still too much for the needs of the individual when living a sedentary life, by eating too hastily,—bolting food,—by taking indigestible food, and by taking too much of either the hydrocarbons or

nitrogenous products, relatively, results in all these cases in imperfect digestion and assimilation, with consequent accumulation of waste products in the body, and has much to do, in our American cities especially, with making old vessels in young men. Just how the toxic agent produces the changes is in doubt. They may act directly as irritants in the blood, producing inflammatory changes, or, as it is conceded, by causing vaso-motor contractions through the irritation of vaso-motor centres, thereby increasing the blood-pressure, hypertension, and subsequent sclerosis. Alcohol, retained excretive poisons from overeating, from nephritis, etc., no doubt produce changes in the vessels in one or both of the ways mentioned. Syphilis is more prone to affect the cerebral than other vessels, and probably both inflammatory and degenerative changes due to the specific poison produce the localized disease. Malnutrition from the destructive effects of the poison upon the blood must also have an important place in the production of the degenerative changes. Purely mechanical causes seem also to produce early sclerosis changes in the blood-vessels, as in the increased blood-pressure due to muscular over-exertion and in valvular heart-disease. Males are predisposed because more exposed than females to the poisons and other causes that produce the disease.

The morbid changes may be local or diffuse, or both conditions may be present. The localized or nodular form is usually confined to the aorta and to the larger arteries. These consist of elevations, yellowish or grayish, upon the lining of the vessels. The edges are abrupt and vary in size from a pin-head to patches that entirely encircle the vessel. The intima is roughened, and when near the orifices of the coronary and other vessels may interfere with the circulation in these arteries; necrosis and rupture of the softened material may take place through the intima, leaving an atheromatous, ragged ulcer, which may afterwards become covered with fibrin. Calcification of the patches may occur in the base of the ulcer as a final change, or the limy deposit may occur in the plaque primarily. Thoma has shown that the nodules are due to the conservative, compensatory process; a filling up of a depression due to a localized weakness of the intima from a preliminary inflammation or degenerative change. Between the atheromatous patches the media and adventitia may be thickened, and in pure senile cases these coats may be thin and weak. In purely senile cases, too, there is usually atrophy of the kidneys, liver, and even of the heart. In some cases the heart is hypertrophied.

In diffuse arterio-sclerosis the process is usually general and may be combined with the nodular form. The subjects of this disease are usually of middle age, but it may occur earlier. Councilman reports a case in a negro of twenty-three. I saw a case of syphilitic origin in a man of twenty-seven. Osler says the diffuse form is very prevalent among negroes. The aorta and its branches are usually dilated and the walls thickened. The intima may be perfectly smooth, but usually, especially in the larger vessels, presents scattered nodules of the atheromatous form. The media

shows hyaline and necrotic changes involving both the muscular and yellow elastic fibres. The intima shows a cellular proliferation in the subendothelial connective tissue which is most marked opposite the weakened, degenerated areas of the media. The endothelium shows fatty degeneration. The walls of the vessels are in places thickened by the degenerative change, and in others thinned; the calibre of the vessels in some places is lessened, in others increased, the latter amounting often to aneurism. In this form the heart is usually hypertrophied, and if the coronary vessels are involved, there is often fibrous myocarditis. The kidneys may be contracted. The pulmonary system represents some degree of sclerosis in all cases in which the arterial tension is increased for a long time; as in chronic emphysema, chronic tuberculosis, and valvular heart-disease.

The symptoms may be obscure or latent and the disease be recognized only upon most careful examination, or may be discovered only at the autopsy. No uniform clinical course can be described. The subjective symptoms and the physical evidences of the presence of the disease will differ with the organ or organs affected and also with the degree of sclerosis. In the local form there may be no external manifestations of the disease on inspection of the patient or on palpation of the arteries. The peculiar symptoms due to the involvement of the coronary arteries, the cerebral or the renal vessels, will, however, often enable one to make a rational diagnosis. In the diffuse form the left heart is usually hypertrophied, and this is evinced by a heavier impulse-stroke, dislocation of the apex-beat to the left, and an increase in the area of cardiac dulness. Sometimes a systolic murmur at the apex is present, or a prolongation of the first sound and an accented aortic sound. The presence of pulmonary emphysema may obscure the signs of hypertrophy. In some cases, especially the purely senile, the heart is atrophic and the sounds weak. The heart may beat rapidly or slowly and is sometimes irregular. The palpable arteries are hard and tense, sometimes large and as often small. At times the radial pulse will follow the heart systole by a distinct interval. The palpable arteries are also frequently tortuous. The condition of the palpable arteries, however, is not a sure indication of the condition of the arteries of internal organs. Marked sclerosis of the superficial arteries occurs, and the arteries of the important organs of the body may be affected but slightly, if at all. So also may the arteries of important organs be affected and the superficial vessels give no evidence whatever of the disease. The sphygmographic tracing is of great value in estimating the arterial tension, the degree of elasticity of the vessel wall, etc. The sphygmogram is not uniform, however, and is necessarily modified by the condition of the heart and the vessels.

The symptoms referable to the cardio-vascular systems are also variable. There is frequently a sense of post-sternal and epigastric weight, oppression, with some dyspnoea, brought on at first by unusual physical exertion or by ordinary exercise, especially soon after a meal. This distress

becomes more manifest as the disease increases and is aggravated by lesser disturbances. Any emotion, food, walking, etc., may bring it on. Pain of a peculiar, heavy character may be added, and inability to lie down without discomfort. True angina pectoris is not infrequent, with the characteristic restlessness, pallor, cold extremities, sense of constriction of the chest, etc. Cardio-vascular spasm with angina may occur with cyanosis, dyspnoea, etc. I have seen acute pulmonary oedema associated with the attacks of angina. Next to the heart the brain presents the most characteristic symptoms. There may be cerebral hemorrhage with a paresis or paralysis of portions of the body. There is frequently numbness of some part or extremity. A disturbance of one or more of the special senses may be found, as tinnitus aurium, strabismus, floating specks in the field of vision, or temporary blindness, thickness of tongue with difficult articulation, aphasia, vertigo, etc., due to hemorrhage of small amount, or to degeneration or softening of a region of the brain from obliteration of a terminal artery or from thrombosis. The memory and general intellectual faculties may be impaired. Epilepsy may result with a lesser degree of sclerosis, but sufficient to modify the cerebral circulation. A common complaint after mental effort is a sense of weight or constriction about the base of the skull, a sense of fatigue in the roof of the mouth, and general weariness.

The kidneys are frequently involved and present many of the clinical evidences of interstitial nephritis. It is difficult to differentiate clinically between the true form of contracted kidney and that of arterio-sclerosis; to say whether the arterial or the renal disease has been primary. In arterio-sclerosis the urine is, as a rule, below the normal quantity in twenty-four hours, the specific gravity is higher than normal, the urine is dark and frequently contains much uric acid, or the urates. The opposite condition obtains usually in interstitial nephritis. Gangrene of the extremities, due to thrombosis or endarteritis, is not an infrequent occurrence in the senile form.

Arcus senilis is present frequently in senile cases, but is usually absent in the younger patients. It may be present also without arterio-sclerosis.

The treatment must vary with the part of the body involved. Much may be done to retard or modify the disease before irreparable damage is done, and especially in the gouty form of the disease. A diet suitable to the case must be selected. This in some cases will consist of the nitrogenous elements chiefly, and in others of the cereals and hydrocarbons. When the kidneys are involved, a diet as free as possible from urea-forming products should be chosen. In all cases it is important that the existing malnutrition should be overcome by an abundance of proper food. Milk in generous quantities is the food *par excellence* for all patients. If necessary to aid its digestion, it may be free from the cream, even diluted with water, or peptonized. Excretion should be maintained by giving a large amount of fluid. In addition to the milk a pure water should be taken when the stomach is empty. With this the kidneys, skin, and bowels will

be more active. The skin should be further stimulated by baths, and, if necessary, simple laxatives suitable for the case should be given. Proper physical exercise should be prescribed.

The medical treatment of a prophylactic kind should be directed to the improvement of the general nutrition. The iodides that have been so commonly used I have no confidence in, excepting in syphilitic cases. I have had most excellent results from the use of iron, in a form suitable to the case, in all cases of a gouty form, and in all where malnutrition existed. I have been surprised with the result in the amelioration of symptoms and in the modification or disappearance of much of the arterial disease. This, of course, does not apply to the true senile form. Of the preparations of iron, Basham's mixture in one-half to one ounce doses gives the best results. The tincture alone or combined with diluted phosphoric acid is also easily borne in suitable cases and gives excellent results. A combination of iron and arsenic is also a good hæmatic restorative.

In all cases it is essential to restore nutrition, and if the diet, medication, and general hygienic management are directed to that end, much will be accomplished in retarding the course of the disease. The medical treatment and general management of the conditions that arise in the last stages of the disease, such as angina, cerebral hemorrhage, etc., must vary with the degree of trouble and the general condition of the patient. No reasonable hope can be held out to a patient in that stage of the disease of anything more than palliation of the symptoms.

The following cases will illustrate some of the conditions peculiar to the disease :

CASE I.—M. K., male, age sixty, capitalist, married, American. Gives a distinct family history of tendency to blood-vessel diseases on paternal side. Father and paternal grandfather died of apoplexy. An elder brother also died of cerebral hemorrhage. The patient has had excellent habits all his life. There is no venereal history, and he has never used alcohol, excepting as medicine. He has suffered from acidity, flatulency, and dyspepsia for the last twenty years, and chronic constipation has troubled him all his life. He has suffered from what he calls muscular rheumatism for many years. Otherwise than for the troubles mentioned above, he has been well and has applied himself to business continually, never taking a vacation. In November, 1890, he was exposed to rain, became thoroughly chilled, and suffered from an acute attack of left pleurisy, from which he recovered in a week. At the date of examination, December 20, 1890, he complained of inability to remember the names of his friends and forgot some essential details of business transactions. His family said that he made a misuse of words, frequently using a word without relative meaning in a phrase. In writing he was apt to insert a meaningless word also in the sentence. In other respects he presented no symptoms of importance. On examination the superficial arteries are markedly sclerosed. There is arcus senilis, well marked. Emphysema pulmonum masks any alteration in the size of the heart.

During the next two months the cerebral manifestations of the patient increased ; he became irritable and suspicious of his family and friends, was inclined to sleep heavily ; his appetite was at times enormous and he digested his food seemingly without trouble. The urine was for twenty-four hours from thirty to forty ounces ;

the specific gravity never less than 1020, dark in color, and the phosphates were increased; urea from one and one-half per cent. to two per cent; no albumin or casts.

In February, 1891, he first showed slight paresis, some thickness of speech, and great difficulty of articulation; at times the paresis of the right upper extremity and difficulty of speech was very marked; on other days there seemed to be little difficulty of speech, and the power of the right hand seemed about normal. Upon the whole, however, the paresis increased until it extended to the right leg.

Early in March, 1891, there was evidence of double dry pleurisy, without rise of temperature. This caused him no distress and was recognized only upon auscultation. The pleurisy continued to the time of his death. Pericardial friction was discovered in the latter part of March, giving no manifestation of discomfort to the patient. The pulse was not increased in number, and there was no rise in temperature; at this time, however, there was a decrease in the amount of urine of twenty-four hours; the specific gravity was increased to 1030, there was a trace of albumin and casts, and the urea was relatively diminished. Cerebral symptoms increased in severity; there was difficulty of speech—an inability to articulate—at all times. He continued irritable, suspicious of his family and his friends, and at times made attempts to leave his room and the house.

In April, 1891, there was a greater increase in the right hemiplegia and unconsciousness for short periods. From this time on the patient was confined to his bed, and there were slight irregular elevations in temperature. He died on the 7th day of May, 1891, after several days of complete unconsciousness and a gradually rising temperature to 107° F. just before death. During the last few days there was an exhibition of pericarditis and pleurisy, and an increase of the symptoms referable to the kidneys.

This case represents the cerebral variety of arterio-sclerosis with probable miliary aneurism of the cerebral vessels with slight hemorrhage or of localized cerebral softening and degeneration, and later large hemorrhages, amounting to an apoplexy. The habits of the patient were continuous work without rest; continued indigestion and probable lithæmia for many years did much to hasten the senile tendency.

CASE II.—W. K. A., aged sixty, railway manager, American. Came to me on May 30, 1892, complaining of dizziness, of a peculiar singing which he described as occurring in the head at the occiput. This, he said, he did not hear by means of the ears, but there was a continuous hissing sound, sometimes musical in character, in the head. He also complained of numbness of the tongue, and at times he had a difficulty of speech, which he described as a "clumsy tongue." He complained of no other symptoms, but said that these were present most markedly when he was overworked or when he became wearied by business affairs. He gave no family history of interest excepting that his father was gouty. He had lived an exemplary life, used alcohol only in the form of claret or Rhine wine at dinner.

An examination showed marked symptoms of arterio-sclerosis, rigid and tense pulse. The temporal arteries were distended and tortuous. There was marked arcus senilis. There were topi present in the small joints of the fingers. There was a slight systolic murmur heard at the apex not transmitted in any direction. The aortic sound was slightly accentuated. The urine was concentrated, containing no abnormal ingredients, but a slight decrease in the urea of twenty-four hours. He was advised to diminish the amount of his work, to take a simple mixed diet without fermenting sweets and other trash, and to drink much milk. He was also advised to take more physical exercise within the limits of fatigue, and to avoid exposure of the surface of the body to cold, and to keep up the excretions of the skin by baths

of moderate warmth. He was given Basham's mixture one-half to one ounce three times a day after meals. From the beginning there was a diminution in the disagreeable symptoms, and within three months he was entirely free from the singing noise and from the dizziness, excepting when he became over-fatigued or excited. The urine was increased in quantity, the urea returned to the normal percentage, and he gained gradually in weight and strength. There was no perceptible change, of course, in the arteries, but the systolic murmur disappeared. I have observed this gentleman every two or three months since 1892. There is a continuous improvement in his general health. He is better nourished, his blood-vessels are less rigid; he is not so easily fatigued; he is able to carry on an immense amount of work with much less effort than at any time before in his life. He has faithfully followed out the directions with reference to diet, exercise, and general hygienic measures, and presents a case of arrested senile arterio-sclerosis.

CASE III.—J. T. S., male, aged fifty-eight, drover, American, married. There is a family history of long life without any distinct account of disease of blood-vessels. An only brother, fifty-two years of age, suffered from chronic Bright's disease.

The patient expressed himself as having been a well man all his life. He had vertigo at times, and on two occasions suffered with coincident nausea, with a feeling of great weakness and cold sweat over the whole body.

In December, 1890, he suffered from a severe vertigo, falling and hurting one knee, which caused severe pain. On the same day he again had vertigo, and suddenly fell unconscious, and remained so for several minutes. When consciousness returned the pain had entirely disappeared from his knee, and he was able to return to his home. March 12, 1892, while returning from New York he awakened and had difficulty of speech, which has never entirely disappeared. There was a sense of heaviness in the throat and in the roof of the mouth. His digestion had always been excellent; bowels regular; he has never used alcohol in excess. There is no venereal history.

On April 15, 1892, he came to me for examination, and the above-described conditions and symptoms were cited. His height is five feet eight inches, weight two hundred and ten pounds, flabby, pale skin, and general appearance of a broken-down man. His speech was thick, there was difficulty in articulating some words. His mind was clear, but his perception seemed slow. Temporal arteries tortuous, radials thickened, some increase of tension, moderately full pulse. Arcus senilis extending entirely around the cornea. There was a systolic murmur heard at the apex, and evidence of enlargement of the left heart. Urine two quarts in twenty-four hours, specific gravity 1022, no albumin, urea normal in quantity for twenty-four hours. The patient's general complaint was a feeling of weariness and sense of pressure in the occipital region, and a heaviness or weariness, as he expressed it, in the roof of the mouth. This latter symptom was aggravated, he said, by fatigue, mental or physical, or by worry and excitement of any kind. The diagnosis of arterio-sclerosis, most marked in the cerebral vessels, was made. Patient was placed upon a milk diet, of which he had from two to three quarts daily. He was allowed no butcher meats, no sweets or acids, and only a moderate quantity of other food. He was enjoined from excessive work, and advised to take a rest from business, and much physical exercise, within the limits of fatigue. There was steady and uninterrupted improvement in this patient's symptoms from the beginning. His weight was gradually reduced from two hundred and ten pounds to one hundred and eighty-five, when he was last seen in 1894. The dizziness disappeared relatively fast, and the sense of weariness also rapidly improved. The sense of weight or heaviness in the occipital region and in the mouth remained for a year, and was especially manifested when the patient was overworked or became excited. He now feels this only when he has been injudiciously excessive in mental work.

The medication consisted of the use of Basham's mixture, alternating with the tincture of iron, with phosphoric acid and glycerin, after meals. One of these preparations he has taken almost continuously for two years.

CASE IV.—Mrs. W. B., aged forty, American, married to her second husband. The patient is unable to tell of the specific cause of death in her family, and can only say that her parents and grandparents lived to be old. She expresses herself as having enjoyed good health all her life. On February 10, 1891, she was suddenly seized with right hemiparesis, difficulty of speech, and right homonymous hemianopsia. The extremities were cold, the pulse small and rapid, and the patient in the state bordering on hysteria. The urine was somewhat diminished in amount for twenty-four hours, the specific gravity 1010, slight albuminuria, a few hyaline casts, and one per cent. of urea. The face was red, but the mucous membranes were generally pale. The diagnosis made was probable cerebral hemorrhage with chronic Bright's disease. Under proper diet and the use of iron there was a slight improvement in parietic symptoms, and the condition of the kidneys improved until there was no evidence of trouble. While the kidneys were excreting a practically normal amount of waste, there was a slight increase of the parietic symptoms; and although no history of venereal taint was obtained from the husband, the patient was placed upon iodides and mercurials as a test. Such marked improvement occurred almost at once that it seemed to confirm the diagnosis of syphilitic sclerosis of the cerebral vessels. Within six months the parietic symptoms had practically disappeared under the treatment, and the patient seemed on a fair way to complete recovery. As this result could not be promised definitely to the husband, he decided to try the treatment of a man who promised absolute cure, and the patient passed out of my hands.

During the next seven months, while on a visit to the East, in January, 1893, the patient had a sudden return of the trouble with all the manifestations of the first attack. She was seen by Dr. Starr, of New York, who at once made a diagnosis of specific endarteritis, with slight cerebral hemorrhage or thrombosis, and consequent local cerebral softening. With the use of iodides and mercurials the patient again improved, and was able to return to her home in the early part of March, 1893. Since that time she has been under my care constantly. She was taking from fifty to three hundred grains of iodides every day, excepting for a week or more on two or three occasions, when the stomach was allowed to rest. Mercury was administered in the form of inunctions or plaster, or by internal use. The patient still presents slight unsteadiness in attempting to walk, but has full and complete use of both arms. There is a slight thickness of speech and slight weakness of the left external rectus muscle. Her mental powers are somewhat impaired. She is emotional and eccentric. It is probable that complete recovery will not follow, as there are doubtless sclerotic changes in both the blood-vessels and the brain that cannot be removed.

These are a few examples of the many cases that have come under my notice during the last few years. I have not seen a case of sclerosis that could be traced to lead-poison or to malaria. The largest number of cases occurring in middle life have, in my experience, been due to gout. Chronic nephritis, especially of the interstitial variety, is usually accompanied by arterio-sclerosis; and it is not an uncommon thing for all of us to have such cases with apoplexy, or other cerebral symptoms. I now have two cases of arterio-sclerosis suffering from apoplexy of recent origin.

A DEMONSTRATION OF THE ENDOGENOUS FORMATION OF THE MALARIAL PARASITE.

BY CHARLES LESTER LEONARD, A.M., M.D.,

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THE determination by Lavarán of the constant relation in malaria between the peculiar type of fever and the parasite which he discovered in the blood has led to a revolution in the clinical diagnosis of this disease, and to many marked advances in its study and treatment.

Those who have continued these studies have found the hæmatozoön to be always present during the fever, and have determined that it is a polymorphic parasite, which possesses a vital cycle, through which it passes over and over again in the blood, and which has a constant relation to the cause of the fever and ceases only with the termination of the disease. These facts and the fact that the disease is transmissible by the transfusion of blood from the malarial patient make the hypothesis tenable, if not demonstrable, that this organism is the cause of the malarial fever.

There has been, and yet is, much discussion regarding the nature, forms, and functions of the malarial parasite, and there exists a wide diversity of opinion on certain points. Whether the parasite of malaria is a protozoön capable of assuming different forms and of passing from one to the other in a continuous life cycle, or whether there are divers forms which produce different types of malarial fever, is yet a mooted question; but it is generally admitted, as stated above, that the malarial organism is a polymorphic parasite, which passes through a life-cycle while present in the human blood, and it is highly probable that there are resting or spore forms in which it may remain inactive for a long period, and possibly other forms in which it exists outside of the body, and perchance a cycle which it passes through there.

The vital cycle, as seen in the tertian form of malarial fever, has been studied by various authors. Golzi describes it as follows: An amœboid parasite, from one-fourth to one-fifth the size of the red blood-corpuscle, in which marked activity is seen in the pseudopodia and an absence of the pigment is noticeable. The organism increases in size, occupying one-half to two-thirds of an entire red blood-corpuscle, and contains melanin (Celli), in the shape of small rods and granules, which it has derived from the pigment of its host. The red blood-corpuscle is destroyed as the parasite increases, until it is entirely replaced by the organism. During this time segmentation has commenced, and, after the destruction of the red blood-corpuscle, the parasites break up into the first or amœboid forms, which attack new red corpuscles, while the pigment gathered by the parent protozoa is liberated.

Manson divides the life-cycle as exhibited within the human body into “(1) minute nucleated bodies, or spores, which are free in the blood; (2) small epi- or intracorpuseular bodies, presumed to be these spores which have become attached or have attacked the red corpuscles; (3) large intracorpuseular pigmental amœboid bodies; (4) sporulating intracorpuseular forms known as *corps en rosace*, or rosette bodies; (5) the last mentioned, outside the blood-corpuscles, breaking up and becoming resolved into the first mentioned, or free spores; (6) intermediate forms which serve to connect these types, and suggest, if not prove, that together they form a complete vital cycle.”

The life-cycle of the malarial parasite has, however, never been absolutely demonstrated, although the results obtained by competent observers in different parts of the world prove, almost beyond a doubt, that the malarial parasite is a hæmatozoön, polymorphic in character, possessing the property of reproduction and complete development within the human body, and of passing through a definite vital cycle again and again.

It is to a demonstration of the endogenous formation of the malarial parasite—*i.e.*, the connecting link between the extremes of its life-cycle—that I wish to draw your attention. Although it is the demonstration of but one step in the cycle, the positive proof which it affords of that step makes its value greater, establishing, as it does, the polymorphic character of this hæmatozoön and making the probability of a life-cycle almost a certainty.

In a paper read before the Academy of Natural Sciences of Philadelphia (see the society's Proceedings, 1895), I described “‘A New Method of Studying Cell Motion,’ which consists in the making of a consecutive series of instantaneous photomicrographs of the same microscopic field taken at definite intervals, and the comparative study of the series.”

Before studying the photomicrographs produced according to this method, which demonstrate the endogenous formation of the malarial parasite, it will be well to study the individual members of the life-cycle illustrated in the accompanying photomicrographs.

The stages illustrated are (1) the free non-pigmental hyaline amœboid; (2) the intracorpuseular pigmented; (3) the extracorpuseular or free pigmented; and (4) the crescentic.

The illustrations are photomicrographs taken from fresh specimens which were kept at the body temperature and were examined and photographed upon a warm stage. The magnification is to two thousand diameters, measured by the projection of the lines of a stage micrometer. The lens used was a Zeiss's one-twelfth oil immersion. The length of exposure was one second.

The free non-pigmented hyaline amœboid form, seen in Figs. 2 and 3, is a minute globular hyaline mass, of a slightly different density from the surrounding medium, varying in size, but seldom exceeding one-fifth the diameter of a red corpuscle. It is found attached to a red corpuscle, and

FIG. 1.



FIG. 2.

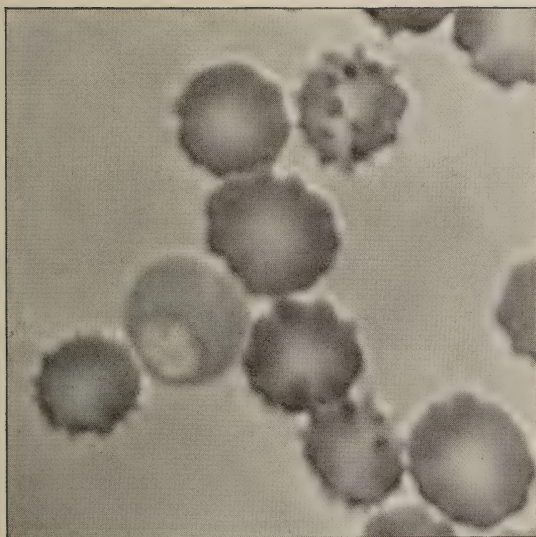


The endogenous formation of the malarial plasmodium.

FIG. 3.



FIG. 4.



The endogenous formation of the malarial plasmodium.

FIG. 5.

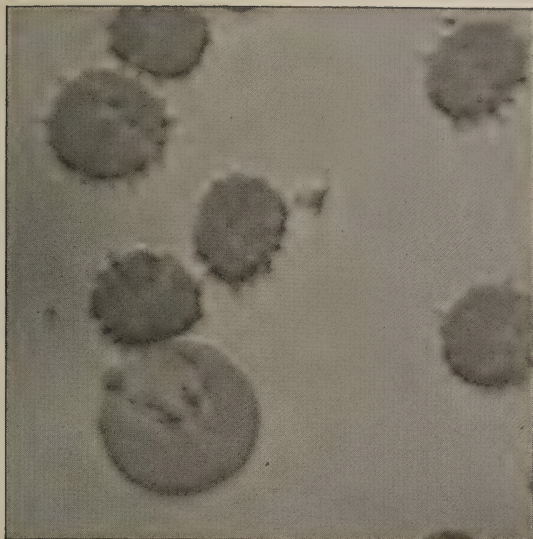
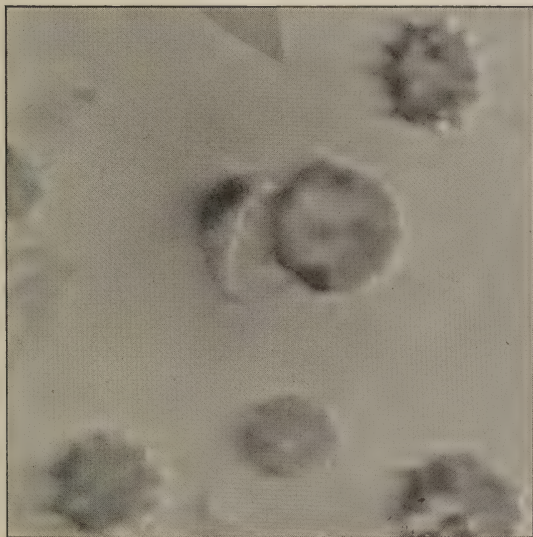


FIG. 6.



The endogenous formation of the malarial plasmodium.

is also seen in active amœboid motion within the red blood-corpuscle. It represents the first stage of the life-cycle of the malarial hæmatozoön.

The intracorpuseular pigmented form, seen in Figs. 4 and 5, is developed from the non-pigmented amœboid form, after it has entered the red blood-corpuscle, and contains a pigment—melanin, which is a derivative of the hæmoglobin of its host—collected in a granular form. It varies in size, sometimes gradually increasing until it occupies the entire corpuscle. In Fig. 5 you see one within a macrocytè.

The extracorpuseular pigmented form, seen in Fig. 1, is the intracorpuseular pigmented body which has come out of the red blood-corpuscle, either by the extrusion of the individual or by the formation of a number of these bodiës within a corpuscle and its subsequent rupture. I have photomicrographs which show them as small as the free amœboid non-pigmented bodies.

The crêscentic body, or malarial crescent, seen in Fig. 6, is probably a resting or spore form, and is found generally in cases of malarial cachexia. The one shown in the illustration is apparently a collapsed free pigmented body, in which the cell-contents have been collected on one periphery, and may or may not represent a true malarial crescent. The line connecting the horns of the crescent, which is noted by numerous authors, is very clearly shown in this instance, and probably represents in the majority of cases the cell-wall of the altered hæmatozoön.

These are not all the forms of the malarial parasite, but are representative members of its life-cycle. There are besides these many transition forms and variations.

Photomicrographs 1, 2, and 3 are the series to which I would direct particular attention. A careful study of the fields will show that they are identical, and, consequently, any variation which may take place in the succeeding members of the series must be attributed to changes that took place in that identical field during the time covered by the series of photomicrographs. I have used but three members of a series extending over sixteen minutes, but they represent the active change which took place during that time in the malarial parasite.

Fig. 1, as stated above, shows the free pigmented malarial parasite, or the last stage of the life-cycle of the hæmatozoön. Fig. 2, taken two minutes later, shows this parasite breaking up; the resultant forms are free, non-pigmented, hyaline, amœboid bodies, or the first stage of the vital cycle. Fig. 3, taken four minutes later, shows the same form with no marked change, but it is clearer; the first form, or free amœboid, is clearly seen, as well as the granules of melanin which are being liberated. These are frequently found free in the liquor sanguinis of blood from malarial patients.

This series, therefore, clearly demonstrates the endogenous formation of the free, non-pigmented, hyaline, amœboid malarial parasite, proving that it is derived from the free pigmented form, and is consequently the primary form, or first stage in the vital cycle. The free pigmented form, or mother

cell, is shown to be one of the last stages of the cycle. It is, however, possible that this is but one of the modes of reproduction, and that others, described by competent observers, are equally correct, although the rosette form is probably a mode of transition from the intra- to the extracorporeal form.

The change which took place occurred in this instance in the two-minute interval between the taking of the two photomicrographs, which shows how rapidly it may occur in a parasite in which there was previously no sign of segmentation. The series also proves the polymorphic character of the parasite.

My thanks are due to Dr. Judson Daland for his kindness in allowing me to utilize the material from which these studies were made.

SOME CASES OF ACUTE INTESTINAL OBSTRUCTION, WITH DEDUCTIONS.¹

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THE following cases briefly recount my experience in laparotomy for acute intestinal obstruction. As will be observed from the results, they constitute a gloomy page in my journal of abdominal work. It is the positive destructiveness of this affection to human life that makes it of such intense interest to the physician and surgeon. The limited number of operated cases here reported, together with an individual observation of probably as many more not subjected to operation, fully conform to the accepted belief of the hopeless nature of acute intestinal obstruction unless treated by early laparotomy.

CASE I.—Male, aged twenty-four years, who while wrestling brought down a right inguinal hernia. Taxis was applied by the attending physician, and the tumor reduced with apparent relief to the patient. The following day the doctor found him much relieved, still there was pain, which he referred to the region of the umbilicus. On the third day the physician was again called, and found the abdominal pain much more intense; morphia hypodermatically and a cathartic were given, as there had been no operation from the bowels. The evening of the same day found him about the same, he having rested easily most of the day from a narcotic; no action from the bowels. An enema brought away fecal matter. Morphia was again given. On the morning of the fourth day the patient was resting badly; complained of great abdominal pain, which was described as like the pain felt during an attack of obstinate constipation and bowel-trouble from which he had suffered two years before, and on account of which his life was despaired of for ten days. Abdomen slightly tym-

¹ Read before the Southern Surgical and Gynæcological Association, November, 1894.

panitic, with no tenderness or other symptom in the recent hernial region. Temperature 101° F., pulse 110. Had vomited rather freely once. Morphia was again given, with the effect of quieting him through this the fourth day. The evening found him little changed, except the vomiting, which had increased, and which had changed from a watery mucus to a slightly green-tinged serum. The abdomen was more swollen; the enema faecal-stained, but no gas; respiration was labored, and the limbs were flexed in the attitude of peritonitis. Hot applications were ordered and morphia hypodermatically. The physician informed the family that he strongly suspected a continuation of bowel obstruction from some cause, and suggested a consultation. I was requested the same night to see the patient early the next morning with Dr. Warner.

During the night of the fourth day he grew rapidly worse, vomiting frequently and in large quantities; the pulse became extremely weak, and respiration was much embarrassed from tympanites. Hiccough troublesome.

When I saw the patient on the morning of the fifth day at nine o'clock, his condition was most serious; pulse 142, temperature 102° F., the abdomen tense and very tympanitic, an anxious expression of countenance, sunken eyes, and weak voice. There was some hiccoughing. The quantity of vomited fluid greatly exceeded that imbibed, and was the green-tinged, sour-smelling serum characteristic of obstruction. No marked faecal odor was detected.

In consultation with the doctor we agreed upon immediate laparotomy as holding out the only hope of relief. The pulse of the patient improved slightly for an hour before being placed on the table. Operation: Incision in the median line; the peritoneum was much engorged and thickened, with evidences of acute inflammation. The cavity contained a quantity of serum and lymph-flakes. Thinking it probable that the cause of obstruction was about the right internal ring, I explored this region first, and found such to be the case. Tracing by the sense of touch the intestine to this point, the imprisonment of a very small segment of bowel could be felt. The sensation to the finger was as if some one had taken a loop of intestine and, pressing it against the internal ring, the merest segment had stuck in the orifice of the ring, and that very little traction would pull it off. This, however, was a delusion, for a little traction demonstrated the adhesion to be very firm. I insinuated my finger into the ring, keeping the ball of the finger next the bowel, and, aiding this movement with gentle traction, relieved the constriction. Less than one inch of the small intestine was imprisoned just within the internal ring. The constricting ring had nearly cut through the several coats of the bowel on one side, the serous coat being entirely destroyed. The integrity of the knuckle of bowel was not much impaired.

The cavity was flushed with boiled water, a glass drain inserted, and the wound closed. The pulse was seemingly better than at the beginning of the operation. Vomiting continued on any attempt to take the slightest fluid for two days. Respiration, which had been very slow and sighing, showed little tendency to improve. Urination was frequent and copious.

On the morning of the second day after operation the temperature was 100° F., pulse 120; vomiting and restless; respiration labored and slow. On the morning of the third day the temperature had fallen to 96.5° F., pulse 128. Increased artificial heat and whiskey by rectum brought the temperature up to normal by noon. Passed gas by bowel; gave enema, which was followed by faecal movement. The drainage-tube was removed the same evening, as there was no secretion of any account. From this time on the patient made an uneventful recovery.

CASE II.—Child, aged four years; seized with abdominal pain and evidence of pronounced shock. When first seen by myself a few hours afterwards, the temperature was 99° F. Calomel in one-eighth grain doses was given hourly until one and one-half grains were taken. This failing to act in ten hours, castor oil was given.

This was followed by enemata in eight hours, none of which caused the slightest fecal action or the passage of gas. During the twenty-four hours in which this treatment was being instituted the child never vomited nor strained at stool, and seemed to be much quieted by hot fomentations applied to the abdomen. The grave symptoms of increasing tympany and accelerating pulse were progressive. At the end of the third day the respiration was much embarrassed by very marked tympanites; pulse 150.

Operation; median section. Greatly distended intestine rushed through the incision. After a difficult search the hand ruptured a small fetid abscess in the left iliac space, which proved to have surrounded the necrotic bowel of a twist or volvulus of the descending colon just above the sigmoid. The little patient's condition was such at this stage of the operation as to warn a hasty cessation of manipulation, or else a death upon the table. The badly-damaged bowel was treated as best we could; the abdomen rapidly irrigated with hot water; iodoform gauze packed in around the abscess point, and closure of the abdomen. Death in two hours from shock.

CASE III.—Young man, aged twenty-one, was seized with abdominal pain, greatest in the right iliac region. The family physician was called, and prescribed an opiate. He was recalled the following day to find the patient much worse; vomiting and straining at stool. Calomel was given, and later cathartic pills and Rochelle salts, all of which were vomited. Upon examination at the end of the second day, the physician discovered a sausage-shaped mass in the right inguinal region. Hot applications were made, and morphia was given hypodermically.

The patient, who lived a distance of twenty miles into the country, was first seen by me on the morning of the fourth day from the beginning of this trouble. At that time the temperature was 102° F.; pulse 138 and bad; stercoraceous vomiting, cold, clammy sweat. The physician had diagnosed intussusception. An operation was immediately performed under the most unfavorable surroundings, chief of which was a too-well-ventilated room, and that in bitter cold weather. Median section; general exudative peritonitis; the tumor (a specimen of which I show you here) was composed of an intussusception of eight inches of the ileum near the junction with the colon. The bowel was necrotic in some places, and so firmly adherent as not to permit of its release. The intussuscepted mass was resected, and the bowel reunited by an end-to-end anastomosis,—Czerny method; the abdomen was irrigated and drained. Death occurred in twenty-four hours from progressive sepsis, the result of septic peritonitis existing prior to operation.

CASE IV.—A woman, aged fifty-four, while walking home from the house of a friend was seized at eight o'clock P.M. with severe pain in the abdomen, referred especially to the region around the umbilicus. On reaching her home the family physician, Dr. McDermott, was called. He gave an hypodermic injection of morphia, and was recalled during the night to repeat the medicine. The following morning vomiting set in, with little diminution of the pain. Morphia was again given, and hot applications made. On the evening of the same day I saw her in consultation. The vomiting had been much less during the day as a result of the morphia, and she had slept some. Temperature normal; pulse 84. She did not present the appearance of a seriously sick woman. Examination of the abdomen revealed nothing. Three drachms of Rochelle salts were given and retained. This was repeated during the night. On the morning of the third day several enemata of glycerin and warm water caused to be passed per rectum some fecal matter mixed with seeds of fruit and undigested food, but no gas. Every four or five hours morphia had to be given for recurrence of the vomiting and pain, which were promptly relieved by it. At this time, the third day from the inception of the trouble, the morning temperature was 99° F., the pulse 88. The expression was not so good as at my first visit the evening previous. When she did vomit it was green-tinged serum. I thought I could detect a small mass in the descending colon; and this,

with the good condition of the patient after three days of apparent obstruction, and the fact that waters of the enemata would often be stained, led me to believe that the obstruction was probably faecal impaction. On the evening of this, the third day, I found no improvement, although under the sedative action of a dose of morphia several large doses of Rochelle salts had been retained. Pulse 100, temperature 100.5° F. Slight icteric tinge of the skin, and looking haggard. Has had no morphia since morning, is restless, and vomiting green-tinged serum. Pain moderately severe; little abdominal tenderness or tympany. My opinion, given to the physician at this evening visit, was that I could scarcely see any reason for abandoning my diagnosis of twelve hours before,—namely, acute faecal impaction; but should the bowels not respond by the following morning, I would operate in order to be more fully master of the situation.

The following morning at nine o'clock found that Dr. M. was compelled to resort to morphia during the night to control pain and vomiting; the patient had slept six hours, and looked much brighter. Pulse 98, temperature 99.5° F. We, personally, gave her a large enema of glycerin, turpentine, and warm water, which was returned very slightly colored, but no gas. Tympany very slight; no marked abdominal tenderness.

If my previous experience in intestinal obstruction had taught me one thing more than another, it was the value of early action, and I said to the doctor, "With your permission we will operate at once," in which proposition he immediately concurred. Operation at ten o'clock A.M. on the morning of the fourth day. Median section. An over-distended and congested small intestine pushed through the wound upon opening the peritoneum. A little search revealed the pale, shrunken, and empty small intestine beyond the obstruction. This was seized and traced to the point of the obstruction, which was one and one-half inches below, and one inch to the left of the umbilicus. The point of constriction was deeply placed to the left of the lumbar spine, but with retraction of the wound could be beautifully observed to be a segment of the small bowel two inches in length, apparently the jejunum, imprisoned in a mesenteric pocket which had been converted into a snare by the adhesion of two folds of the mesentery, producing a band-like constriction. After clamping one margin of the fold or band with forceps, the bowel was guarded with the finger, and the constriction severed by a nip of the scissors. Other than a very sharp indentation and slight erosion of the serous coat, the bowel was uninjured. Peristalsis through the continuity of the constricted part was almost immediate, as the collapsed distal bowel commenced to vermiculate and fill up by the introduction of faecal matter. The band, which was nothing more than the falciform border of a fold in the mesentery, was ligated and cut off about one inch in length. I could not demonstrate by placing the finger in the bottom of the pocket that there was a condition of so-called rent or slit in the mesentery, such as has been described by some writers.

This patient had never experienced any abdominal trouble in her life before, and was unusually healthy in every respect. The time of this operation was eight minutes. The bowels moved freely and voluntarily in seven hours. The patient made a rapid and uneventful recovery.

The two following cases belong almost in a class by themselves, and in a strict classification of acute intestinal obstruction would usually be omitted; but as they do not differ in any essential respect except as following a surgical procedure, they will be considered here.

CASE V.—Woman, aged thirty-four; a laparotomy for double pyosalpinx of long standing. Many adhesions were encountered; a drainage-tube was used, and

removed on the second day, the patient doing perfectly well. On the morning of the third day the temperature was 99° F., pulse 80. The patient was a very self-willed woman of Swedish descent, and insisted that she could get up if we would let her. This she did do at two o'clock P.M. on the same day, during the momentary absence of the nurse, and walked across the room to a table on which sat a small pitcher of water, with which she proceeded to satisfy her thirst. She returned to bed, and was almost immediately seized with most agonizing pain in the abdomen. The nurse returning was shocked when told what she had done. I was called, and responded in a short time. The pulse was 100, the temperature normal. Abdominal pain was very intense and continuous, so much so that the patient would scream. She was given one-third grain of morphia hypodermically, which had little effect in quieting her. I remained with her for four hours, the pulse accelerating rapidly all the while. At seven o'clock it was 120. Chloroform was given and the abdominal wound reopened. Several coils of intestine were found to be adherent in the left pelvic fossa. On gently separating and freeing these, a tightly constricted coil was felt between the margins of the left broad ligament, and a coil was stretched across and adherent to the raw surface behind the uterus. The adhesions were separated, the abdomen irrigated and redrained. There was no evidence of peritonitis at any point. The patient never rallied; death followed in eight hours.

CASE VI.—Woman, aged twenty-five; operation at the Louisville City Hospital in November, 1893. Double pyosalpinx, with moderate adhesions; no drainage; recovery uneventful until the seventeenth day. During this woman's convalescence she contracted the catheter habit, and, being of an hysterical disposition, the nurse found that the only way she could induce her to pass her urine without the instrument was to permit enough to accumulate to pinch her quite a little, when she would empty the bladder normally and completely. Upon the seventeenth day of an easy non-febrile convalescence she allowed her bladder to become so distended that the nurse catheterized her. Soon after this, which was about eight o'clock in the forenoon, the patient was seized with such severe pain in her abdomen that the interne gave her one-fourth grain of morphia. I saw her about an hour later at my daily round, and she was still suffering most intense pain. The abdomen was flat, the temperature normal, but the pulse was accelerated above 100. Her expression was one of great and continuous pain. I ordered the morphia repeated and a large enema of glycerin given, with especial notice if any gas was passed. At four o'clock P.M. I was notified that the enema was ineffectual, no gas had passed, and that the pain was as great as ever. I ordered a high enema of turpentine and water. At six o'clock P.M. I found her with pulse 110, abdomen considerably distended; indeed, I have never been able to account for such rapid tympany; neither gas nor fecal matter had passed, and the pain was very great. She was ordered to be immediately prepared for a laparotomy.

In the presence of several members of the staff the abdomen was opened, and there immediately presented an obstructive point of fecal circulation. To the right stump of the removed tube and ovary a point of omentum was adherent, and this had formed a snare, behind which a loop of the small intestine had fallen and become strangulated. The offending band was removed and the abdomen closed. The relief was so sudden and positive that the patient never aroused from the anæsthetic and narcotic previously taken, for eight hours. Her recovery was complete and uneventful.

The evacuation of the over-distended bladder allowing the intestines which had been pushed up to suddenly prolapse downward was seemingly the exciting factor in the production of an obstruction, the snare of which was prepared by the previously adherent omentum which was fastened to the stump of the ablated right appendages.

Of these six operations, three patients recovered and three died. I think there will be no disagreement when we assume that all would have died without operative interference. The mortality of fifty per cent. is very great, and yet the few cases reported are in evidence to prove that the large death-rate from operation in acute intestinal obstruction does not come from the lack of adequate surgical methods to deal with every phase of the lesion encountered, but from the late time at which the relief is applied. This does not apply to obstructions following abdominal section, for here the obstruction, as in Case V., comes up so soon after the primary operation that the shock incident to the secondary opening of the peritoneal sac is often more than the patient can endure. Other things being equal, the longer the time which has elapsed between the primary laparotomy and the secondary one for the intestinal obstruction, the more favorable is the prognosis.

The cases reported are a little remarkable for the variety of causes of intestinal obstruction which they represent. It is the usual coincidence that when one has only a few such cases, they will come in a school and will be nearly all of a kind as far as causation is concerned.

Of the cases reported I have to censure myself for the result in only one: that was the child with volvulus; I saw this case from the first. However, it presented many unusual features, and most deceptive in every character. Vomiting was absent throughout the case. The tender age of the patient, if mechanical obstruction existed, would most likely suggest intussusception, and no symptoms of this form of obstruction were present. I was too slow in making up my mind to operate, and when I did it had best not have been done. But my hope for a possibly favorable issue was fostered by the remembrance of success in Case I., which seemed well-nigh hopeless.

Case IV. illustrates most strikingly how one may be deceived in mistaking a most violent (and irremediable by medical means) obstruction for a less dangerous constipation, especially when the condition is clouded by the use of opium. While I do not contend that we can dispense with opium in the treatment of these cases, we should withhold its use, where obstruction is in the least suspected, until a diagnosis can be made. The middle line of reasoning must be adopted. We cannot always diagnose in ten hours, nor even in twenty, and it is one thing to talk of permitting a patient to writhe in agony for that period of time, and another to stand by and see it.

Certainly the practice of masking every abdominal condition characterized by pain with opium is far too prevalent, and its practice gains additional calamity as surgery advances in knowledge which offers relief for the very conditions which are concealed by the cloak of opium and ignorance.

Interesting as it would be to discuss the various causes, and their relative frequency in the production of intestinal obstruction, also the early diagnosis of this condition based upon its symptomatology, the limits of

this paper will not embrace such an extensive subject. After all, the various causes of intestinal obstruction, with their especial or characteristic symptoms are useful only to make up the complete knowledge of the subject, and upon which to study and base certain special technique during operations, should we encounter them as the cause of the obstruction.

The burning question now is to educate men to know that action to be successful must be quick ; that timely aid depends upon the man who first sees the case ; that when a physician, for any reason, suspects that a patient's bowels will not move, he should drop everything else and centre all his time and attention upon that patient ; he should not waste his gray matter by trying to determine if it be a probable intussusception, volvulus, band, diverticulum, or what not ; leave that for the operation to determine ; it is the most reliable way to find out.

The practical and cardinal points in avoiding a fatal delay and making an early diagnosis are to be found in sudden abdominal pain, a rapidly accelerating pulse, the vomiting of much more fluid in a given time than is taken by the mouth, the green-tinged character of this fluid, the anxious expression of countenance when no opium has been used, the fact that although enema may be stained by colon contents, there is no expulsive movement of the bowels and no passage of gas.

These symptoms should cause a physician to suspect obstruction of the bowels, and when this suspicion takes possession of his mind, a new obligation is assumed ; it is his imperative duty to at least prepare for an operation for himself, or by getting some one else in case he does not care to operate ; he should never go home to see what to-morrow will bring forth. The pulse is the sole indicator of the acuity of cause and status of the patient in intestinal obstruction. If a patient is seen at two o'clock P.M., and the pulse is found to be 110, to prescribe for such a patient with the determination to operate the following day if he is no better, usually means that while the physician is taking his much-needed rest that night the patient is passing forever beyond the realm of operative relief. The next morning the physician will probably be much surprised and chagrined to find the pulse 140 and the patient moribund.

INQUIRIES AND SUGGESTIONS RELATIVE TO THE PATHOLOGY OF GLYCOSURIA.¹

BY H. E. MUNN, M.D.,

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THE marked features in polyuria, with sugar, emaciation, constipated bowels, great thirst, and greater or less voracity of appetite, have long been recognized.

In its early history the kidneys were the supposed site of lesion. More extended investigations removed the cause farther back, and the discovery of the glycogenic function of the liver for a time made the latter the peccant organ. However, as no constant nor peculiar changes were manifest in this organ, and as Bernard's experiments in puncture or irritation of the floor of the fourth ventricle near the nib of the calamus scriptorius had produced glycosuria, another removal of the seat of its origin was made.

It was not long, however, before it was learned that the glycosuria thus induced was transitory, and the pathological home of mellituria was as yet undiscovered. Dickinson and others report having found various lesions of the brain and spinal cord associated with mellituria. These appear to be syringomyelia and similar vacuolations and dilatations of perivascular and pericellular spaces. Douglas Powell seemed to be the only one who was able to find anything confirmatory of Dickinson's observations. Hyaloid thickenings of the blood-vessels of the brain were noted by Stephen Mackenzie and Seymour Taylor in some cases, and miliary aneurisms of the retina in one. Tyson was unable to find anything of Dickinson's lesions. Several have reported meningitis, tubercular, traumatic, and apoplectic effusions, and tumors of the brain, especially in the neighborhood of the medulla. All of these have been found to be inconstant, and very many of these pathological changes would appear to be either consequent upon the glycohæmia, or to have no possible causal relation to the disease. None of these lesions have seemed to fill the requisites as being the real pathological basis, the primary source of the disease in question.

Latterly attention has been directed to certain other facts of the morbid anatomy of glycosuria,—namely, the occurrence of various diseased states of the pancreas. Long ago Cowley observed calculi in the pancreas of a diabetic, and Bright noted pancreatic cancer in a similar case. Instances of this kind have been accumulating since. Lancereaux, in 1877, communicated to the French Academy of Medicine specimens of profound lesions

¹ Read before the Northern Tri-State Medical Association, Hillsdale, Michigan, December 11, 1894.

of the pancreas from cases dying of diabetes mellitus. Those he stated to be cases of unusual severity and rapid progress, and characterized by peculiar symptoms,—emaciation, polydipsia, polyphagia, and peculiar alvine discharges. Depierre, in 1880, confirmed these observations in rapidly-failing cases, having a duration of six months to three years. Tyson also, in 1882, reported a case of this kind, terminating fatally in one year, which was accompanied by uncontrollable diarrhoea, with creamy stools, jaundice, and pancreatic disease. The pancreas was found enlarged, and numerous gritty particles disseminated through it. Such reports have attracted general attention to the state of the pancreas in the disease in question. In speaking of this, Tyson says, "One of the organs most frequently found diseased is the pancreas, and, according to Senator, it is fair to assume that disease of the pancreas is present in about one-half of all cases. As the result of increased experience, I am inclined to attach much more importance to pancreatic disease as a cause of diabetes than I did a few years ago. Among the changes found is a pseudo-hypertrophy, which consists chiefly in a hyperplasia of the connective tissue, fatty degeneration of the gland-cells, and atrophy of the glandular structure, cancerous disease, calculous concretions in the duct, with or without obstructions, and cystic dilatation." The clinical history of glycosuria, except in a few such cases as cited by Lancereaux, Depierre, Tyson, and others, in which there is lenteric diarrhoea, with more or less of other indications of failure of pancreatic digestion, presents nothing which would lead the physiologist or pathologist to infer any important lesion of the pancreas.

One organ, the liver, is almost invariably, perhaps always, the seat of pathological changes of some sort. While these changes are quite various, they are, without doubt, the sequences, under varying circumstances, of that condition of this organ, whether transitory or permanent, which is necessary to the production of glycosuria,—an active or arterial hyperæmia of the liver. Citation of authorities on this point is at this date unnecessary. It may be stated as an established fact that, whether permanent or temporary, or from whatever cause, spontaneous, traumatic, or experimental (except the intravascular injection of sucrose), a condition of glycohæmia sufficient to induce glycosuria has for its immediate cause a dilatation of the hepatic artery with rapid flow. The increased velocity of the blood-current appears as necessary to the production of the condition as the excess of volume, as shown by the experiments of Cyon, Aladoff, and others.

The changes in the liver are, nearly always, some enlargement, occasionally diminution in size, decrease of fat, and atrophy of hepatic cells. The liver may be enlarged to thrice its normal bulk, also darker in color, firm, and hard. The acini are enlarged, the capillaries dilated and distended, the liver-cells enlarged, nuclei distinct, cells rounded and indistinct in outline. Frierich and others describe hyperplasia of hepatic cells. Hypertrophy of the connective tissue (cirrhosis) also occurs. Disappearance of the fat normally found in the hepatic cells may happen, followed

by occasional atrophy. Gamgee reports intense fatty degeneration of the whole organ with lipæmia.

Quite recently S. Solis-Cohen¹ reports a case, and refers to others in the service of T. S. K. Morton, in which glycosuria, or at least saccharine urine, accompanied appendicitis. At first they declined operation on this account. For some reason not stated, operation was finally resorted to, and in the cases referred to, Solis-Cohen states that no sugar was found after recovery from the appendicitis.

Experiments with the nervous system, since Bernard's discovery, have shown as follows concerning the pathology of this disease. "Section of the vagus produces no glycosuria unless the central end is stimulated; stimulation of the peripheral end being without effect. Glycosuria results from transverse section of the medulla oblongata, of the cord above the second dorsal vertebra, of the filaments of the sympathetic accompanying the vertebral artery, upon destruction or extirpation of the superior cervical ganglion, sometimes after division of the sympathetic in the chest, also after section or extirpation of the last cervical ganglion, section of the two nerve-filaments passing from the lower cervical to the upper thoracic ganglion around the subclavian artery, forming thus the 'annulus of Vieussens,' and after section or removal of the upper thoracic ganglion." All these operations paralyze the vaso-motor nerves, by which in health the tonicity of the blood-vessels of the liver is maintained.

From these experiments Tyson concluded that the path of the glyco-genic (why not glycohæmic?) influence must be from the medulla into the cord, thence by filaments to the sympathetic accompanying the vertebral artery into the inferior cervical ganglion, thence through the annulus of Vieussens into the first dorsal, and thence through the prevertebral sympathetic cord and branches, "not precisely determined," to the hepatic blood-vessels (by way of the celiac ganglion). The difficulties which Tyson and others find concerning the "branches not precisely determined" arise from a disagreement among investigators as to the results of section of the sympathetic below the first dorsal ganglion and of section of the splanchnics.

These experiments have been performed on rabbits, and Cyon and Aladoff have pointed out that section below the first dorsal ganglion produces vaso-motor paralysis not only of the hepatic blood-vessels, but also of those of the very long intestine, and, by the distention of so large a vascular area, "as much as all the vascular system together," prevents the occurrence of one equally important factor in the production of glycosuria, —namely, rapidity of flow through the liver.

A large number of cases have been reported within the past few years, of great difference of intensity and arising apparently from many different causes. The severity of the affection has ranged from the temporary presence of sugar in the urine simply, without polyuria, polydipsia, or poly-

¹ New York Medical Journal, August 11, 1894.

phagia (the glycosuria of S. Solis-Cohen), to cases embracing all these features, with rapid emaciation and all the other usual phenomena of grave and fatal character (the diabetes mellitus of S. Solis-Cohen). Some of these cases I quote here.

E. Peiper, of Griefswald, reports a girl of seventeen, who drank ice-water when heated by dancing: diabetes, great thirst, three months' duration; recovered. Same reporter: man, stood an hour in cold water to the knees, was seized with great thirst, drank greedily of cold water, developed diabetes mellitus; course and termination not stated. C. J. Kelly reports a boy of ten, exhausted and perspiring from driving a cow, who drank a large quantity of water, developed diabetes, and died in eleven days; also reports similar cases. David Drummond reports a boy of seven who developed fatal diabetes after a blow on the head. Arnaud reports diabetes in syphilitics.

Germain Sée, discussing Lancereaux's paper on pancreatic origin of diabetes (in Academy of Medicine, Paris), states, "that it is not the absence of pancreatic juice, but the removal of the pancreas, and possibly the injury done the sympathetic in the operation." Hedon confirms this view, and states that "plugging the duct with paraffine or removal of the head of the pancreas alone does not produce glycosuria." De Dominicis (original investigator) says, "only two-thirds of the cases of removal of pancreas developed glycosuria. Intravenous, peritoneal, or subcutaneous injection of pancreatic infusion does not influence diabetes. Slight wounds of pancreas or duodenum induced slight, transient glycosuria." De Renzi and Reale confirm De Dominicis, and also state that the removal of the duodenum or salivary glands produces similar results.

According to Saundby, a great variety of lesions—tumors pressing on vagus, enlargement and thickening of the sympathetic nerves and ganglia—are found with or causing glycosuria.

Leve (in Eichhorst's clinic, Zurich) found tuberculosis of lungs and intestines, chronic splenic tumor, acute hemorrhagic nephritis, atrophy of pancreas, of left solar plexus and suprarenal body. Other cases are reported of atrophy of pancreas and fatty degeneration of aorta.

Magelson reports a man of thirty-three who had a severe glycosuria following influenza. Toralbo reports a case of glycosaliva. Finally, we may mention that some toxic agents, as phloridzin and uranium nitrate, may produce glycosuria when administered internally.

Besides the pancreatic theory of the pathology of this disease, which has perhaps received the most attention (and probably justly, as having some experimental facts for its basis), others have been put forth by several writers,—Kirsch, of lipomatosis; Ebstein, of a supposed degraded state of protoplasm, and consequent inability to regulate carbonic-acid production; and others, of the existence of some ferment in the plasma or corpuscles.

Possibly a slight review of the treatment, hygienic and medicinal,

would not be out of place before further consideration of the pathological question.

The hygiene of this malady consists in, so far as practicable, the removal of the sugar-producing articles from the dietary. The medicinal agents, upon which most are agreed as to their being valuable, are opium, its derivatives or constituents, ergot, and arsenic. Iodoform has some advocates. Mineral acids, vinegar, and hard cider have cures reported to their credit.

The cases which are grouped under the names Glycosuria, Diabetes Mellitus, and Glycohæmia have a wide variation of symptoms, results, and exciting causes; but they all have one, and doubtless two, remarkable features in common. These are the presence of sugar in the urine and in the blood also. They may all, therefore, be designated properly glycosuria or glycohæmia. The term diabetes, if we attach the significance which Solomon Solis-Cohen applies to it, as having reference to the polyuria present in the more marked and typical cases, with the usually associated polydipsia, polyphagia, emaciation, etc., would not be appropriate to all cases of glycosuria.

Glycosuria may be classified into :

1. Cases with slight or marked saccharine urine of transient duration.
2. Those of recurring and intermittent glycosuria without notable symptoms otherwise and not fatal.
3. Transient cases of typical diabetes mellitus.
4. Cases of typical diabetes mellitus which under careful hygiene and dietary, possibly medical treatment, remain stationary, without emaciation or fatal termination.
5. The more severe typical forms, continuous, progressive, and fatal. The latter might be again divided, making another most malignant class, including those with serious pancreatic or other lesions, not simply secondary to the cachexia or glycohæmic disturbances, and exhibiting especially disastrous qualities.

I have left out of consideration the generally accepted occurrence of very slight, transient glycosuria in health, dealing only with the distinctly recognized morbid states.

Now, after reviewing the subject in the light of such facts as are at our disposal, let me make as briefly as possible some inquiries.

First, is it possible that we have in all these cases, of which glycosuria is the most notable, distinct, and common symptom, several diseases having widely different pathological bases?

Is it probable that basic lesions of the cerebro-spinal nervous system, of protoplasm generally, of the pancreas and salivary glands, of the blood-plasma or corpuscles, of the sympathetic or other organs, may all be the direct immediate cause of several diseases having this remarkable symptom in common?

Inasmuch as the milder forms of glycosuria (distinguished as such by S. Solis-Cohen in contradistinction to diabetes mellitus) present no special

features differing from the more severe and malignant cases, except in the lack of a few, or many, of the symptoms which go to make up the complete, typical, morbid ensemble, may we not conclude that they are but varying individuals of one pathological species? If this is the case, it is anything but unique.

Let us consider what light the result of treatment sheds on the subject. The withholding of amyloid and saccharine substances has the effect only of limiting the intensity of the glycohæmia,—that is, the amount of sugar in the circulation,—and, by so doing, curtailing the polyuria, polydipsia, polyphagia, the vascular degenerations and other secondary evils which the presence of sugar in the circulation in considerable quantities brings about. Probably nothing more.

As for the medicinal treatment, ergot serves to contract the dilated vessels and thereby diminish the hyperæmia of the liver, a necessary antecedent of the glycohæmia. As the hyperæmia is a sequence of the primary lesion, it is a question how much ergot may do and how long the effect may continue.

Arsenic is well known to have an “elective affinity” for epithelial structures, and might therefore be expected to exert a beneficial action where there is lesion of glands or of the nervous system.

Opium, or some of its alkaloids, is generally recognized as of the greatest value in this affection. Its effect must be exerted through the nervous system.

Considering the modes of action of the most valuable remedial agent and the fact that hepatic hyperæmia, on which depends the glycohæmia, must be dependent on vaso-motor disturbances, is it not probable that some lesion of the sympathetic exists in all cases of glycosuria? Is it not possible, even though the exciting causes may be widely diverse? May not the sympathetic lesions in different portions of that system produce glycosuria? May not this condition be induced by paralytic lesions of vaso-constrictors, or by irritation of the vaso-dilators?

I intended to perform some experiments on animals and submit the results in this paper, but the time was too short, and I shall ask your forbearance for the completion thereof until another time.

I would suggest that careful and thorough post-mortem and microscopical examinations be made by physicians in all accessible cases. We should cultivate the field of the sympathetic. It is the “darkest physiology.” With the advancement of microscopical investigation the so-called “functional diseases” are rapidly diminishing. May we not soon establish the pathology of glycosuria on an organic basis?

CLINICAL LECTURES.

ABSCESS OF THE UPPER ABDOMEN.

CLINICAL LECTURE DELIVERED AT THE BOSTON CITY HOSPITAL, DECEMBER 18, 1894.

BY A. LAWRENCE MASON, M.D.,

Associate Professor of Clinical Medicine,

AND

HERBERT L. BURRELL, M.D.,

Assistant Professor of Clinical Surgery, in Harvard University.

GENTLEMEN,—This patient, a man forty-two years old, entered the hospital a month ago. He had been well except for chills and fever and typhoid fever when in the navy some years since. There is nothing characteristic in his previous history.

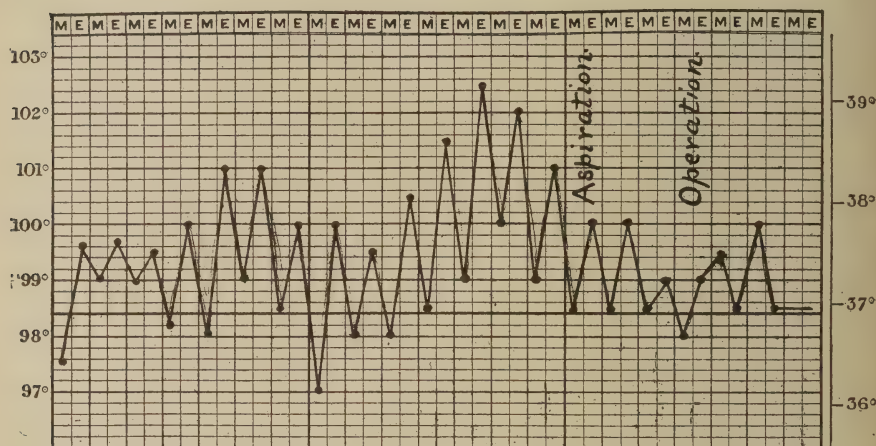
When he entered the hospital he complained of pain in his left side, which had troubled him for six weeks, and at the epigastrium, which had given him discomfort for three months. From this cause he had abandoned work. He was in bed but two days before he came to the hospital. He had had slight dyspnoea; his bowels had been regular and appetite fair.

On physical examination over the seat of pain in the left side, which was on a level with the diaphragm, there was heard a dry friction, a to-and-fro rub of moderate intensity, but no râles. Cough and other signs were absent. There was good resonance over the lungs, and the right side was entirely normal. The liver dulness extended from the sixth rib to the costal border in the right mammary line; the left lobe of the liver appeared to be normal in size. The splenic area was not enlarged; the abdomen was lax and not tender. There was some tenderness on pressure in the epigastric region. The patient remained in bed for a few days. The pain in the side and the friction rub disappeared, epigastric tenderness diminished, the febrile symptoms abated, and he appeared to be doing well.

On November 18, twelve days after admission, he complained of a swelling at the lower part of the sternum and below the ensiform cartilage, which caused a projection. The swelling was about the size of a hen's egg and remained slightly tender. The epigastric region was dull on percussion. In about a week he had improved somewhat rapidly and the swelling had subsided, so that the diagnosis was extremely uncertain. He was then transferred to the convalescent ward, and was up and dressed and helping

in the ward work. At this point (Fig. 1) the swelling was undistinguishable below the ensiform cartilage, and during this period when there was little rise in temperature he was apparently doing well. The pulse was normal.

FIG. 1.



Temperature chart of patient before and after operation.

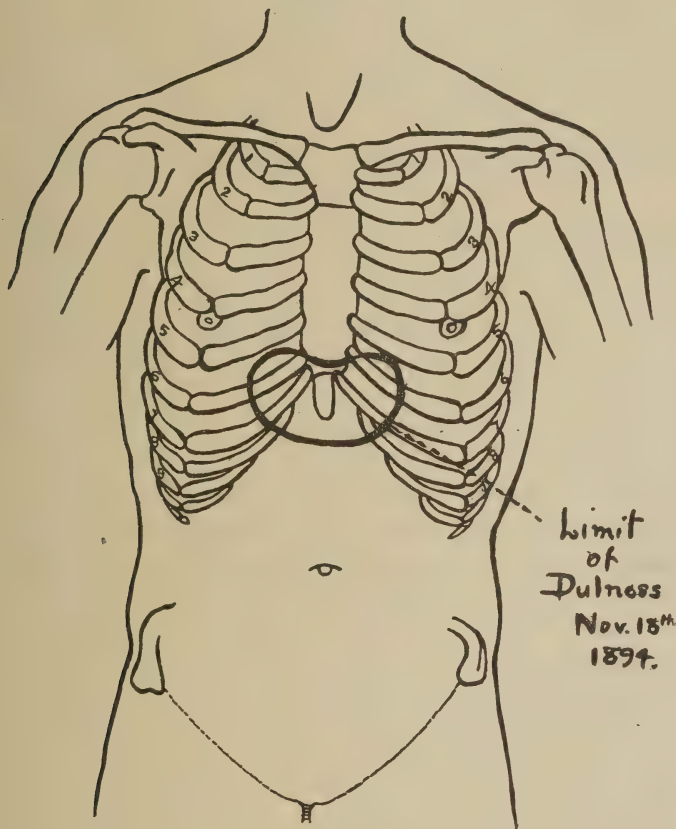
A few days ago the temperature rose again; he had slight chills and a little sweating at night, there was more bulging at the lower part of the sternum and at the epigastrium, and suppuration seemed probable. Over the area described, extending somewhat below and to the left of the ensiform cartilage, the percussion tone was perfectly flat and there was a doubtful fluctuation. (Fig. 2.)

A blood examination showed 6,300,000 red corpuscles and 7500 white. No leucocytosis. Respiration was normal throughout the lungs and there were no signs of pleurisy. With the above-mentioned evidences of abscess it was thought best to explore; so I aspirated, introducing the needle at a point just below and a little to the left of the ensiform cartilage. It entered a cavity, with resistant wall, three inches or more in depth, extending backward and upward. Nearly a pint of ichorous pus was evacuated, which showed the presence of the staphylococcus aureus and other organisms. No liver cells were found.

The causes of abscess in this region are numerous, and there will not be time to go into the details of the etiology of suppuration in this locality. In this particular instance the symptoms are not very positive: the patient had a certain amount of gastric disturbance; he had no vomiting; little pain in the region of the stomach; no history of any disease which would involve the liver. It seems unnecessary to go beyond the upper part of the abdomen for diagnosis, from the fact that the lower part has appeared to be perfectly healthy and uninvolved; so that we must seek for our cause in the organs or parts which lie under the diaphragm,—*i.e.*, between the arch of the diaphragm and the edge of the ribs.

1. Taking first the solid organs, we must consider the liver, spleen, kidney, and pancreas. Abscess may arise in connection with inflammatory processes in all these organs. There has been no antecedent disease of the liver that we are aware of, and no dysentery, to account for it in our case.

FIG. 2.



Area of dulness.

If the patient has an hepatic or a perihepatic abscess, the symptoms do not seem to correspond with those which are generally found in suppuration in the perihepatic tissues or in the liver itself. Abscess of the liver, a disease common enough in the tropics, is more often found in the right side, where it is easily reached either by aspiration or by exploratory incision. Abscess of the left lobe of the liver, as this would be if it were abscess of the liver at all, is not especially common, but, in fact, very rare, being found, according to Frerichs, in only one case in thirty. Moreover, there has been no marked tenderness over the region of the liver; the temperature chart ran rather low; and the patient did not have sweating, chills, emaciation, or that loss of strength which almost invariably accompanies abscess of the liver. Therefore there seems to be no great probability of abscess from that source.

Abscess of the spleen is usually traumatic or septicæmic, and there is no history of injury preceding this illness.

Abscess of the head of the pancreas is extremely rare, but it is sometimes found post mortem.

Perinephritic abscesses are more common, and arise from causes which set up inflammation in the tissues about the kidney, very frequently calculi or injury; but perirenal suppuration is almost always found to present itself behind, in the lower costal region, where oftentimes there is fluctuation with swelling, redness, and all the marked signs of an extensive suppurative process.

So much, then, for the solid organs which are in the subdiaphragmatic region.

Empyema which has perforated the diaphragm might find its way to the epigastrium, but we have no history of such an illness, and the lungs and pleuræ are now clear. I will not mention the distant points to which an empyema may migrate. You know that suppuration in the pleural cavity does find its way to distant parts of the body, sometimes as low as the groin, simulating a psoas abscess.

2. Inflammatory processes may originate in the hollow organs,—the stomach or intestine.

Perhaps the most common cause of abscess in this region is perforating ulcer of the stomach. Gastric ulcer not infrequently finds its way through the wall, and in that case may perforate directly into the abdominal cavity, setting up acute peritonitis, or it may form adhesions to the surrounding tissues, and then an abscess outside the stomach is walled off by the conservative processes of nature and remains for the time confined to the upper abdominal cavity. The site of perforation varies very much; sometimes, even if it is in the anterior gastric wall, the adhesions may be so dense and thick that the lower abdominal cavity is not invaded. An abscess may form which points outside in the lateral costal region or even at the epigastrium. But the most frequent seat of gastric ulcer is in the posterior wall, and in that region subphrenic abscesses may originate from perforation.

An abscess may also be due to perforating ulcer of the duodenum and may be shut off from the abdominal cavity, and in the same way retained in the subdiaphragmatic region by adhesions.

There is one peculiarity of these perigastric and periduodenal abscesses which needs attention,—viz., the fact that those which communicate with the gastro-enteric tract usually contain air and give signs of a peculiar nature. An abscess behind the stomach and communicating with it would naturally be filled with air, and the physical signs arising from that condition are extremely interesting and perplexing from the fact that the abscess may be of large size, containing a quart or more of pus with a considerable amount of air. The diaphragm may be pushed up as high as the third rib or even to the second interspace, and over this area which is filled with pus and air we may get the most typical signs of pyopneumothorax, tympanitic

percussion over the part of the abscess containing air, with succussion sounds and metallic tinkling; so that on examining such a case for the first time you would be almost sure to think that you were dealing with a case of pyopneumothorax. Tapping the chest might not aid very much in the diagnosis: pus and air would escape, as in pyopneumothorax.

There are certain other diagnostic features of gaseous abscess which I will not mention in detail, as this is not a case in point; but you can see that such a case would require most careful attention to the history and physical signs to enable you to form a conclusion as to the origin of the abscess. If we can determine that it is below the diaphragm and contains air, we may be sure that the cause is perforating ulcer of the stomach or bowel,—it may be of the vermiform appendix.

In this particular case there is no sign of air, there is no tympany, and the only indication of the involvement of the thoracic cavity was the friction rub at first heard in the left side, in the diaphragmatic region, without other signs of pulmonary disease or pleurisy.

Still there may be perforating ulcer of the stomach and consecutive abscess without air, for abscess from that source may not contain air from the fact that after the stomach has been perforated and the tension is relaxed the ulcer may heal spontaneously, provided that the abscess finds exit through the diaphragm, the intestine, or the parietes, and the patient lives long enough for the hole in the stomach to close. This condition has been verified by a number of post-mortem examinations; in one of my patients who was operated on for the abscess, but died several weeks later, the cicatrices of two gastric ulcers were found.

In the case before you there was an early epigastric swelling which subsided and then reappeared. It was thought possible that an abscess had discharged through the bowel, although no pus had been seen in the stools.

There is one condition of the liver of which I failed to speak, which not uncommonly creates an abscess, and that is the suppuration of an echinococcus cyst. In that case you find the hooklets in the exudate. They were not found in the pus from this patient; moreover, that disease is rare in this latitude.

There is great danger that an abscess in this region may find its way into the abdomen and set up a general peritonitis, or upward through the diaphragm, causing empyema or true pyopneumothorax. There has seemed to be little risk of that in this case, owing to firm adhesions below and the absence of thoracic symptoms. In fact, I think it strange that a man with so much pus in his system should be as comfortable as he has been. But in the worst and most complicated cases a train of thoracic symptoms occurs; there is in the first place an adhesive pleurisy set up by the proximity of the abscess below the diaphragm to the base of the lung. Sometimes the pus perforates the diaphragm and lung and is evacuated by the bronchi; sometimes it enters the pleural cavity, causing empyema. If

the pleural cavity communicates with the stomach, there is pyopneumothorax, and the recognition of its cause may be difficult; but, when you find an empyema in the lower portion of the chest and cannot account for it, it is well to be on your guard against the possibility that the inflammation has originated below the diaphragm and found its way upward.

The course of these abscesses tends upward rather than downward,—that is, the thorax is more apt to be involved than the lower abdomen. I think this is due to two causes. The patient being long on the back, the pus does not tend strongly to go downward through the adhesions; and, again, the upward suction which preserves the arch of the diaphragm draws the pus in the same direction, towards its concavity.

While this patient is being etherized for operation by Dr. Burrell, I will call your attention to these diagrams, illustrating previous cases.

In the first an ulcer of the duodenum formed adhesions between the duodenum, gall-bladder, liver, and parietes. After perforation the pus from an air-abscess found its way by a sinuous tract over the anterior surface of the liver to its summit under the right wing of the diaphragm, which was not penetrated; but there was a right-sided serous pleurisy, which was twice tapped without reaching the abscess. Post-mortem examination showed its origin.

Air-containing abscess in this locality usually results from duodenal ulcer or perforative appendicitis, whereas a similar abscess from ulcer of the stomach is more likely to be on the left. With the accumulation of air above, this case gave the signs of pyopneumothorax.

The other diagrams illustrate cases of gaseous abscess from perforating gastric ulcer, and subphrenic abscess with secondary empyema.

It is quite evident that the diagnosis and the cause of abscess in the upper abdomen may be very obscure; also that the primary disease, which may be hepatic, gastric, or intestinal, is so grave in character that the patient's life must be in a good deal of danger. If the abscess is undetected, as is often the case, nature seldom effects a cure. If it is discovered and evacuated, it may be too late, and drainage is often difficult. When the cause is an old ulcer which has perforated, the adhesions are often so dense that the ulcer cannot be reached and sewed up. But, as was before mentioned, the evacuation and drainage of the abscess may result in complete cure, with spontaneous healing of the gastric ulcer.

Wherever the abscess may originate in the patient before us or in similar cases, it is apparent that early or repeated exploration with the aspirator is necessary, and, when pus is found, the cavity must be drained through an opening and counter-opening if possible. This patient is in good condition for operation, there are firm adhesions, and a favorable prognosis may be given.

In conclusion I will say that, although abscesses in the upper abdominal cavity are not very common, you will find a considerable amount of literature pertaining to this subject, published during the last ten or fifteen years,

especially from the clinic of Professor Leyden, of Berlin, and from the London and Paris hospitals. The eighth volume of the Transactions of the Association of American Physicians contains several papers relating to subphrenic abscess and a bibliography.

OPERATION BY DR. BURRELL.

As Dr. Mason has told you, we may never know the exact source of this abscess. Presenting, as it does, just below the ensiform cartilage, the obvious thing to do is to make an opening at its most prominent part. The positions of the peritoneum, the transverse colon, the stomach, and the lobes of the liver are such that I intend to make a small incision just to the left and below the ensiform cartilage, separating the fibres of the left rectus muscle, and then to pass an aspirating-needle in various directions until I find pus, and, when I find it, to follow it up with my finger, and, if I find a cavity, drain and pack with gauze.

The treatment from a surgical stand-point is drainage, and drainage of a foul cavity. The drainage may be blocked by the stomach and liver meeting in the space where this abscess now rests. If I could get at the dependent portion of the abscess at the back, surgically, I should be much better satisfied, but in order to do that I should have to traverse the pleural cavity. This would contaminate the pleura. Therefore, it seems to me, that, if this abscess has walls and is circumscribed, it is best to go as far as possible towards its centre and then to pass a sound down to the left side until I can make a counter-opening below the pleura. Of course, I shall have to be governed by circumstances.

I think it is clear that the bunch in the epigastrium is under the ensiform cartilage and to the left side, as it comes out clearer under ether, owing to the recti muscles being relaxed. Here is the border of the costal arch; there is a mass which occupies the position of the ensiform cartilage, and, from appearances, I think that I shall strike pus very early.

On making the incision I come into a hard, dense wall, and I don't think it discreet to go any farther with the knife, so I aspirate. Pus exudes around the aspirating-needle; probably the needle is too small to evacuate the pus. [The needle was withdrawn and a larger one introduced.] I think you now see pus coming out. The cavity was pretty thoroughly emptied by Dr. Mason's aspiration; consequently, it is rather difficult to get much pus.

I have already come to a dense tissue which is evidently connected with the abscess. At this point it seems to me safer to use my finger than to explore with a knife. My finger meets a dense mass which suggests a wall of fibrous tissue. Now I force my finger through this wall and enter a cavity which is filled with a warm, gelatinous fluid. I can feel the pulsation of vessels; to the right and above I can feel my finger breaking down clots; below the cavity is walled off, as if by the transverse colon, which may be glued down to form the inferior wall of the cavity. My

incision is carried down to this inferior wall of the cavity. As my finger passes beneath the sternum I can all but touch—yes, I can touch—what I believe is the diaphragm. Now, all this may be a cavity in the left lobe of the liver. Now my finger rests at the junction of the sixth rib with its cartilage. I think that a counter-opening at this point will give more complete drainage.

In order to ascertain the full extent of this abscess, especially if it pass downward to the left, I am going to pass a sound in and map out further than my finger can the full extent of the abscess. Now that I have evacuated the clots, I am clear that this involves the left lobe of the liver, for I can feel here the friable edge of the liver from time to time against my finger; the source of this abscess was not at all clear when I first introduced my finger, but it is now. The surprising thing to me in this case is the dense wall that has been formed at the anterior part of the abscess, where it is walled off from the transverse colon; it is so dense that not without force could I go farther in that direction.

These incisions give an inlet and an outlet to sterile water with which I shall flush the cavity. I see no reason why this should not drain perfectly. The drainage-tubes are secured in position by safety-pins, and iodoform gauze is wrapped about them, and for the next forty-eight hours the cavity will be frequently flushed.

The question of caries of the sternum or of the ensiform cartilage had to be considered in this case, as it is a cause of abscess in this region. I should not have been surprised to have found an eroded surface of the sternum explaining this abscess. It is, however, a subdiaphragmatic abscess, originating in the left lobe of the liver. Fortunately, its presence was discovered by Dr. Mason, and our operation with sufficient drainage will, I trust, cure our patient.

[On January 8 the patient was again presented to the clinic. The incisions had entirely closed, and recovery was complete.]

REVIEW OF MEDICINE.

MEDICINE.

IN CHARGE OF JOHN H. MUSSER, M.D.,

Assistant Professor of Clinical Medicine in the University of Pennsylvania; Visiting Physician to the Presbyterian and Philadelphia Hospitals,

AND

J. A. SCOTT, A.M., M.D.,

Physician to the Out-Patient Department of the Pennsylvania Hospital; Assistant Demonstrator of Morbid Anatomy in the University of Pennsylvania.

A Case of Croupous Gastritis. (*Archives of Pediatrics*, April, 1895.)

By John Thomson, M.D., of Edinburgh.

A delicate little boy, sixteen months old, who had bronchitis with consolidation of left base, threw up, in a fit of coughing, a false membrane, and the next day vomited another, which was kept for examination. This membrane, when floated out in water, consisted of two large pieces, one in the form of a long, slightly-curved funnel,—evidently a cast of the pylorus and the adjacent end of the stomach,—the other corresponding to the cardiac orifice and the large cul-de-sac of the stomach. Sections of this false membrane were stained and examined. It was found to consist of leucocytes held together by a small amount of fibrin. No tubercle or diphtheria bacilli were demonstrated. The child became gradually weaker and soon died. The autopsy showed advanced tubercular bronchopneumonia, pleurisy, enlargement of bronchial glands, fatty liver, and tubercle of the spleen and mesenteric glands. The stomach was normal in size, and its mucous membrane vascular, but not abnormal in other respects. No false membrane was found in the stomach, œsophagus, or intestines. The author considers croupous gastritis as almost always a secondary condition, and found in feeble individuals whose vitality has been lowered by exhausting disease.

The Hygienic Importance of Light. (*Zeitschrift für Hygiene und Infektionskrankheiten*, March 15, 1895.) By W. Kruse, M.D., of Bonn.

The author concludes an interesting article with the following statements:

The influence of light on the organs of sight is uncontested. In like manner the mind, without doubt, is affected. The influence of light on chlorophyll vegetation and usually on bacteria is of hygienic interest, because in light we evidently possess the cheapest and most universal means of disinfection for our cities and our dwellings. From this stand-point we

should allow large quantities of light to enter our dwellings, but a consideration comes in view which limits the usefulness of light as a disinfectant for dwellings. The direct sunlight possesses, when compared with powerful disinfectants, various unpleasant actions, as the disagreeable influence of light on the eye which has already been mentioned. The intense heat of the direct rays in our dwellings is often unfavorable hygienically. For these reasons a medium grade of light is preferable.

These considerations lessen the disinfective importance of light in some degree, and it is lessened still more when we remember that each accidental shadow—for example, that cast by an article of furniture—destroys the effect entirely. It may be seen, therefore, that other means, such as cleanliness and systematic disinfection, are necessary for the removal of infectious substances from our dwellings.

The disinfecting power of free sunlight is hard to estimate because its action is very intense and continual. Buchner claims that light is the main source of the so-called self-disinfection of streams. Experiments show, however, that diffuse daylight has no powerful influence on great numbers of bacteria. Practical bacteriological researches concerning the self-disinfection of streams can be cited as containing evidences against Buchner's hypothesis, as, for example, the well-known work of Frank on the bacteria of the Spree and Havel in Berlin.

Early Diagnosis of Glanders by the Strauss Method. (*Berliner klinische Wochenschrift*, March 18, 1895.) By E. Leevy, M.D., and C. Steinmetz, M.D.

In this method a portion of the suspected tissue or pus is injected into the abdominal cavity of a male guinea-pig. Swelling of the testicles begins on the second or third day, and from this symptom alone the diagnosis of glanders is made definite. The affection begins with inflammation and suppuration in the tunica vaginalis, and extends later to the testicles. The characteristic bacilli are found in the pus.

The first case tested was that of a young man, sick with typhoid fever, who had on his right hand a small suppurating wound which had been caused by the bite of a horse, and which from its appearance suggested glanders. A peritoneal injection of an emulsion containing the pus was made in the right lower abdominal region of a male guinea-pig. The testicles began to swell on the third day and the animal died on the eighth day. The autopsy showed swelling and suppuration of both testicles, of the right more than the left, but not of such high grade as is found in glanders. Microscopic examination of the pus, and culture-tests showed the *staphylococcus pyogenes aureus*. The patient went on to recovery and the wound healed.

In order to determine the cause of the condition found in the guinea-pig, eight male guinea-pigs were inoculated in the left lower abdominal region with a bouillon culture of the organism obtained from number one. Two died on the next day of peritonitis. The others remained well, and

no signs of swelling of the testicle appeared. In number three the left seminal vesicle was pierced and was adherent to the abdominal wall.

From the negative result of this research the authors concluded that the condition found in number one was due to injection of the culture into the right seminal vesicle, which accounted for the greater size of the right testicle. This error in the Strauss method may be obviated by making the injection in the median line, above the bladder.

A guinea-pig was then inoculated with a bouillon culture of glanders obtained from a horse. On the third day both testicles were swollen to a large size, and the scrotal tissue was inflamed. Both testicles were bathed in pus, and microscopical examination showed the bacillus of glanders.

Treatment of Acute Phthisis by Continuous and Persistent Reduction of Body-Temperature. (*Australian Medical Journal*, February 20, 1895.) By G. Marr Reid, M.B., of Cobden, Victoria.

This author believes that "it is theoretically and scientifically correct to try the effect of a continuous and persistent antipyretic and bacillicide form of treatment, based on the idea of both lowering the activity and consequent virulence of the bacilli by reducing and keeping reduced the all-necessary surrounding temperature, and at the same time exposing them, when thus weakened and attenuated, to the destructive power of some trustworthy bacillicide." Antifebrin is recommended as the antipyretic, the temperature never being allowed to go above 101° F. The application of a spirit lotion to some absorbent material placed on the chest is also recommended. Inhalation of undiluted creosote, alternating with the administration of the drug by the stomach in gradually-increasing doses, is the germicide.

The history of one case in which this mode of treatment was tried is given in detail, and shows a great amelioration in the condition of the patient, the tubercle bacilli having entirely disappeared from the sputum with a cessation of all the physical signs of phthisis.

The Persistence of Bacillus Diphtheriæ in Children after the Disappearance of the Membrane. (*Revue mensuelle des Maladies de l'Enfance*, March, 1895.) By Messrs. Sevestre and Méry.

These authors have made two series of observations under two different modes of treatment. The first extends through the period from June to December, 1893, in which time eighteen children were treated with topical applications, and with irrigations of the throat and nasal fossæ made every two or three hours, a solution of carbolic acid of a strength of one to one hundred being employed for this purpose. Upon the disappearance of the false membrane, the irrigations were continued twice a day until the patient left the hospital. In fifteen of these cases a positive diagnosis of the presence of a virulent diphtheria bacillus was made. In four cases, after the disappearance of the false membrane, the cultures were sterile, and remained so during successive tests. In two cases the bacilli persisted a short time after-

wards, but had lost their virulence. In one case the cultures, tested on three separate occasions, gave negative results; but one month after the cure, the culture gave, on the contrary, positive results, and precisely at that time the sister of the patient was herself attacked with the disease. Four cases, which had appeared to be absolutely cured, nevertheless preserved virulent bacilli during a period of six to fifteen days. A single negative culture is not sufficient to justify one in affirming that the throat is free from bacilli. In two cases cultures from the throat were negative, but those made from the nasal mucus gave positive results. The persistence of the bacillus in the nasal mucus was very prolonged in one case, being found forty-nine days after removal of the tracheotomy tube, and thirty-eight days after the patient left the hospital. In three cases the persistence of the bacillus in the nasal mucus appeared to be the cause of reinfection, which gave rise to a second attack of croup, terminating in death. In other words, in about one-half of the cases the bacillus of Loeffler disappeared at about the same time as the false membrane, or at least it had ceased to be virulent. But in the other cases it persisted for a more or less time after apparent healing, either in the throat or, more frequently, in the nasal fossæ. The second series were treated with irrigations of Labarraque's solution (50 parts to 1000), and Roux's injections of antitoxin were also employed. All of the cases showed the presence of the diphtheria bacillus in a pure or associated state, the virulence of the bacillus in each case being demonstrated by inoculation in a guinea-pig. The examination of the cultures, made after the disappearance of the false membrane in three cases, gave completely negative results. In four observations the cultures showed the presence of the bacillus, but inoculations proved their non-virulence, and, besides, it was noticed that the short bacillus was present, and not the long one or the medium size, as in the first examination. In three observations the virulent bacillus was found in many successive examinations. In one of the cases, having determined the presence of the virulent bacillus the twelfth day after cure, only the short, non-virulent bacillus was found in various examinations made after this epoch. This bacillus persisted nearly a month after the patient's departure from the hospital. Those cases in which the virulent bacillus persisted were of a very severe nature, in which the convalescence was retarded either by the sequelæ, a paralysis, or by the injections of serum,—eruptions and arthropathies. It will be seen, in comparing these results, that practically no difference is noted in regard to the disappearance of the bacilli in the different modes of treatment. The authors conclude that no precise, extreme limit of persistence of the bacillus can be given, but that in reality one should allow several weeks or a month for the throat, and a longer time for the nasal fossæ, its presence being usually coincident with a more or less abundant nasal discharge, offering, however, no specific characteristics, either in the throat or in this discharge, the methodical bacteriological examination alone conducing to certainty in this regard. Second, reinfections are much more rare in those cases treated with antidiphtheritic serum; but for prophylaxis they

are as virulent as others. Steps have already been taken in l'Hôpital des Enfants Malades and planned in l'Hôpital Trousseau to have convalescent wards. These should preferably be situated in the neighboring country, where the hygienic surroundings for the recovery of the patient would be more favorable.

Notes of a Case of Concurrent Scarlet and Enteric Fever. (*Intercolonial Quarterly Journal of Medicine and Surgery*.) By E. Allen Mackeny, L.B., Melbourne, Victoria.

One of the most noteworthy features of the case was the disappearance of albuminuria when the hemorrhage occurred. It suggested the thought that venesection performed at the right time might have relieved the nephritis, prevented the excessive loss of blood from the bowel, and shortened the course of the disease. The patient was a spinster, aged twenty-two years, residing in a healthy, well-drained suburban villa. She was first seen on June 3, 1893, when the following history was obtained: She had been in bed two days, complaining of nothing but extreme weakness, loss of appetite, and constipation. She had been in perfect health until a fortnight before, when she, as she supposed, caught a cold while out sketching scenery. She had also an abscess at the root of a carious tooth, and to this and a cold she ascribed her illness. A bright pink papular eruption was found on the neck, shoulders, and back. The tongue was furred, and the papillæ were red, enlarged, and somewhat prominent. The fossæ were slightly congested. The temperature was 103.6° F.; pulse, 100. A physical examination of the thorax and abdomen revealed nothing abnormal. The rash was not quite typical, but, taking the appearance of the tongue and throat into consideration, it was concluded that the disease was scarlet fever; and, the presence of enteric fever not being suspected, the fortnight of malaise was ascribed to the cold which the patient said she had caught and to the dental abscess. There was no history of exposure to any infection. On the next day examination of the urine revealed a trace of albumin. The rash faded quickly, and in two days had quite disappeared. The faucial congestion also disappeared. The albuminuria remained the same. The temperature ranged between 101° in the morning and 102° in the evening for some days; and a suspicion of enteric fever arose. On June 8 the evening temperature was 104°, and there was one doubtful typhoid spot on the abdomen. The area of splenic dulness was very slightly increased. There was slight oedema of the ankles and of the lower lip. Vomiting now occurred when nourishment was given, unless it was iced. The skin was hot and dry. Only one pint of urine was passed in twenty-four hours, and it still contained a trace of albumin. A hot pack was now applied for an hour, and the skin acted freely. The temperature fell 2° and the vomiting became less troublesome. During the next week the temperature varied between 103° and 104° in the evening and 101° and 102° in the morning. The vomiting ceased. Constipation was marked, and the

motions were never typhoidal in appearance. There was no tympanites, but there was great hyperæsthesia over the regions of the liver, the spleen, and the kidneys. There was still albuminuria, and on June 17 some granular casts were found on microscopical examination of the urine. The tongue was moist and coated. The temperature began to have a lower range, but on June 25 it again ran up to 104° , and two typical typhoid spots were found on the abdomen. On the next day a sudden hemorrhage from the bowel took place, and more than half a pint of blood was passed, the patient seeming to be at the point of death,—blanched, restless, sighing, and cold. The temperature fell to 97.4° , but rose again the next morning to 105° . The tongue became dry and brown, the pulse rapid and soft; a restless muttering delirium and subsultus tendinum were noticed. The albuminuria now disappeared. The temperature remained between 103° and 104° for four days, and then better morning remissions occurred. There was no more hemorrhage, but for several days very offensive tarry motions were passed. Vomiting returned at the time of the hemorrhage, and persisted for two days, during which time very small quantities of predigested food were administered by rectal injection. On June 30 the patient began to cough, and dulness and moist sounds were found at both bases. On July 6 slight general improvement was noted, and five days later the temperature was normal morning and night. The pulmonary symptoms disappeared; the urine remained clear, and the amount became normal. The skin peeled in branny scales. Convalescence was very slow, and on August 10 the patient was for the first time permitted to go out for a drive in a hansom cab. On the next day she was very ill, her temperature was 103.6° , and the urine, which had been free from albumin for six weeks, was found to contain a large quantity. She was put on the usual treatment for acute nephritis. The amount of albumin soon decreased, and in a fortnight had all disappeared, and the temperature was again normal. Early in September she was sufficiently recovered to go to her home in the country. Twelve months later it was reported that she was in perfect health, and had had no return of renal trouble.

Actinomycosis. (*Boston Medical and Surgical Journal*, March 28, 1895.)

This number contains three articles on actinomycosis. In the first, a case is reported by F. B. Mallory, M.D., in which the nature of the disease was not recognized clinically or at the autopsy. A man entered the Massachusetts General Hospital complaining of gradual failure of health and of cough: he had noticed, two weeks before, a bunch in the epigastrium. On examination the skin over the left epigastrium was found to be reddened and tense, an abscess soon opened and discharged broken-down, apparently tuberculous tissue. The patient was soon able to leave the hospital. Some months later he entered the Boston City Hospital. He was then "dull in mind," and no history could be obtained. On examination

of the lungs, râles and bronchial breathing were found over both apices, and the percussion was subtympantic on the left side. A wound two inches long, which discharged a purulent fluid, was seen below the xiphoid, and fluctuant tumors were found upon each arm. Death occurred on the fourth day after his entrance to the hospital. At the autopsy abscesses were found in the lungs, liver, kidneys, and right side of the brain. The anatomical diagnosis was tuberculosis, broncho-pneumonia, and secondary abscesses of lungs, with interstitial pneumonia, perihepatitis, and abscess of liver. Abscesses of kidneys, abscess of brain. Cultures made from the pus and blood gave the colon bacillus and the staphylococcus pyogenes aureus. Portions of the tissues of the brain, liver, lungs, and kidneys, which contained abscesses, were hardened in alcohol and examined microscopically, and it was discovered that the pathological processes were due largely or entirely to actinomyces. The denser portions of the lungs and the whole of the abscess-like mass in the liver consisted of fibrous tissue riddled with pockets of various sizes, filled with pus in which were many colonies of actinomyces. The more normal portions of the lungs showed numerous areas of broncho-pneumonia caused by the organisms. The epithelium was stripped from the walls, and often only masses of cartilage could be found to mark the site of a bronchus. A comparison of the character of the lesions in this case with those of a case of bovine actinomycosis showed that in human actinomycosis the process was much more rapid. There was less young connective tissue, and it broke down quickly. The actinomyces showed much less tendency to form colonies, and grew in loose tangles and as clumps of bacilli and possibly of cocci. Giant cells, which contained the organism as rods and threads, were found in the young connective tissue.

In the second article two cases observed in Vienna are reported by Howard A. Lothrop, M.D. The first is very similar to the case just related, the disease being considered pulmonary tuberculosis with empyema. The second case was that of a female, aged nineteen years, who, on entering the hospital, had a tumor the size of a cocoanut in the left ovarian region. A sinus which opened on the abdominal wall discharged pus, which by close inspection was found to contain the minute sulphur-colored bodies characteristic of actinomycosis. Vaginal examinations showed that all the pelvic organs were glued together in one firm, resistant mass. Colonies of the actinomyces were found in the urine. The patient died two days after she entered the hospital. At the autopsy an indurated pigmented scar, one-half an inch in diameter, was found in the mucous membrane of the sigmoid flexure, and this was considered to be the primary source of infection.

The author states that the actinomyces of themselves do not lead to pus-formation, so the clinical picture varies according to the seat of origin and the presence or absence of the cocci of septic infections. The appearance of abscess is very often the first symptom to be noticed.

A case is then cited by S. J. Mixter, M.D., who gives the following account: A man between sixty and seventy years of age came to the hospital on account of a little bunch just below the umbilicus which gave him some pain. A malignant tumor was suspected, and an operation performed for its removal. On cutting around the tumor it was found to be attached to the omentum and intestine, but the mass was gradually dissected away, and the incision was closed by suture. Sections of the tumor exposed a pale surface dotted with several small cavities containing a little puriform fluid in which were numerous minute granules. Embedded in the tissue were two spindle-shaped fish-bones about three-fourths of an inch in length. The perforation of the intestine was no doubt the primary lesion, and in this tract the actinomycosis had developed.

The Excretion of Morphine in the Saliva after its Subcutaneous Injection. (*Berliner klinische Wochenschrift*, 1893, No. 49.) By S. Rosenthal.

Positive results have been obtained by the investigator in regard to the presence of morphine in the saliva after the hypodermic administration of even very small amounts of the drug. The quantity excreted was large; the time of its appearance after injection was not able to be determined accurately. Morphine accumulates in the system, and is but gradually removed therefrom. Rosenthal suggests the searching for morphine in the saliva of those suspected of morphine intoxication.—*Centralblatt für die medicinischen Wissenschaften*, March 30, 1895.

Dilatation and Hypertrophy of the Heart resulting from Over-Exertion and Idiopathic Heart-Disease. (*Deutsche Archiv für klinische Medicin*, vol. lv., 1895.) By Dr. Hermann Rieder, of Munich.

After a critical study of the literature of this subject and a discussion of a number of cases, with a close study of the symptomatology, differential diagnosis, and prognosis, this author gives the following as the best method of treating these cases:

Rest in bed must be insisted upon. If this is not insisted upon the frequency of the respiration and pulse will be increased, the pulse will become weaker and perhaps irregular; the area of cardiac dulness continually increases until finally life is ended through a marked insufficiency of the heart. Excitants are to be avoided—such as camphor, brandy, wine, ether—which tend to irritate the heart. Digitalis, which is recommended by Curschmann, and is very useful in many cases, is frequently rejected by some stomachs, giving rise to spasms of vomiting or increasing the tendency already present. In such cases rectal injections of the drug are followed by marked results. The use of strophanthus preparations, and the ordinary cardiac stimulants in addition to digitalis are indicated in the same manner as in other forms of cardiac disease.

Calomel is a drug which has afforded the author great service after the other cardiac remedies had failed.

Narcotics and hypnotics are to be used only with great care, but are sometimes necessary. Since the hypnotics, through the production of sleep, rest the heart, they are in so far to be commended.

Ice-bags have been frequently placed over the heart to lessen its action, but are of doubtful value.

Blood-letting, for relief of the vascular system, preventing the stasis, and decreasing the resistance to the emptying of the left ventricle, is to be recommended, and has produced good results when used by the author. The results have been excellent, especially in the relief, for the moment, of cyanosis and distressing dyspnœa.

The use of aerated beverages is to be avoided not only on account of their excitant action on the heart, but also on account of the increased arterial pressure produced by the contraction of the capillaries.

In case of recovery, excitant causes, as great strains and alcohol, are to be avoided.

Three Cases of Spontaneous Hæmatophilia in Brothers. (*Philadelphia County Medical Society*, January 9, 1895.) By Judson Daland, M.D., and W. Duffield Robinson, M.D.

A boy, thirteen years of age, living in Pennsylvania at an elevation of eighteen hundred feet, is the living member of this group of hæmatophilics. At eight months of age, during an attack of cholera infantum, a petechial eruption appeared, which consisted of spots the size of a pin's head, non-elevated, and black in color. They were found on the abdomen, back, legs, and arms, and were evidently purpuric in character. At the age of five years he had an attack of arthritis, and since that time has averaged one attack every two months, which usually occurs forty-eight hours after exposure to cold or wet. There have been nearly fifty attacks of hemorrhage from various mucous membranes since he was five years of age, but no recurrence of purpura. These were mostly nasal, but hæmaturia followed trauma of the renal region on two occasions, hæmatemesis was induced by an abdominal injury, and an accidental biting of the tongue caused oozing and finally free hemorrhage, which continued for seven days.

Recently, while visiting Philadelphia to receive massage for partially ankylosed joints, he bit his tongue during sleep. Oozing increased for seventy-two hours, when he lost about an ounce of blood per hour. The hemorrhage continued for seven days in spite of the use of many remedies. On the seventh day the pulse at the wrist numbered 70, while the heart-beats were 130 per minute.

The blood was lighter in color than normal, and showed little tendency to the formation of clots. Microscopic examination showed an enormous number of very small microcytes, a few macrocytes, and a moderate increase of leucocytes. There were no parasites nor distorted *red blood-

cells. The Thoma-Zeiss hæmocytometer showed 3,775,000, or 75.5 per cent., and Fleischl's hæmometer showed sixty-two per cent. of hæmogoblin. A few days later the blood showed a normal tendency to clot, and hemorrhage ceased on making a local application of a four-per-cent. solution of cocaine.

The family history revealed the following facts: Of five children, three had died under two years of age without giving evidence of hæmatophilia; the second child, a boy, began to have severe attacks of epistaxis at the age of sixteen months, developed hydrocephalus at three and a half years, and finally died of hemorrhage from the nose; the fourth child had his first hemorrhage when he began cutting teeth, and a fatal hemorrhage occurred when the molars were erupted. The only evidence of tendency to hemorrhage found in the mother was a greater amount of bleeding than normal after extraction of a tooth. The father has never shown any hæmatophilic tendency, and denies syphilis. No case of hæmatophilia has occurred in either family, traced to the fourth generation.

Conclusions.—These cases are particularly interesting for the following reasons:

1. That they occurred in brothers.
2. That they all showed the first tendency to hæmatophilia at an early age, particularly while teething. The oldest patient's trouble began with epistaxis, following an attack of cholera infantum, which may have been a gastro-intestinal purpura. The first case is also interesting from its association with arthritis, and from the statement that frequently the hemorrhage would occur in forty-eight hours after an exposure which would excite a coincident attack of arthritis and fever.
3. The fact that slight trauma would produce extensive hemorrhage, proving that the blood-vessel walls were remarkably fragile.
4. The extraordinary diminution of the coagulability of the blood.
5. The valuelessness of all the ordinary local remedies and agents for the relief of hemorrhage from the wound of the tongue, with the exception of the local influence of cocaine and ice and the internal administration of the fluid extract of ergot. We are disposed to attribute the greatest influence to the enormous loss of blood, by which not only was the fibrin increased, but also the peripheral circulation was slowed, so as to allow of the gradual formation of a thrombus. The use of cocaine as a local hæmostatic was suggested by Dr. W. Duffield Robinson. The remarkably brilliant results obtained in the first case lead us to hope that similar good may be obtained in other cases.
6. The occurrence of marked flushing of the face as a precursor of an attack of hemorrhage.
7. The greater frequency and violence of these hemorrhages since removal from an altitude of eighteen hundred feet to that of two thousand two hundred feet, and the consequent deduction that hæmatophilics should be removed to the sea-level.

8. The opinion of the father that the intense nervous excitement produced by these violent pains in these attacks of arthritis may be an exciting cause of epistaxis.

9. The occurrence of repeated attacks of acute arthritis with intense pain, redness, and great swelling in association with fever and sweating, which are so frequently observed in hæmatophilics, and the fact that they were erroneously diagnosed as attacks of rheumatism. The want of coagulability of the blood at the time of these acute outbreaks, their occurrence forty-eight hours after exposure to cold or damp, the frequent coincident occurrence of hemorrhage, and the absence of endocarditis, are all points in favor of the supposition that these were *not* attacks of rheumatic arthritis, but were hæmatophilic in origin, perhaps due to the effusion of blood into the joints.

10. The second case is interesting from its association with hydrocephalus and the occurrence of death from epistaxis.

11. The third case illustrates the importance of teething in producing the first manifestation of hæmatophilia, and shows how readily death may occur from this cause.

Death from Uræmia after Injection of the Roux Serum.—Guinon and Rouffilange (*Revue mensuelle des Maladies de l'Enfance*, March, 1891) report a case of death, with anuria and anæmic convulsions occurring in a little girl, aged three years, previously healthy and strong, who was suffering from membranous angina, and in whom forty cubic centimetres of the Roux serum were employed. Four injections were given,—the first of fifteen cubic centimetres, the second of five, the third of ten, and the fourth of ten. These authors believe that in those cases in which the kidneys do not act, and in which there is intense nephritis due to diphtheritic intoxication, it is dangerous to make more demands upon the system in order to eliminate new poisons, and therefore do not advise the use of the serum in these cases. They consider that kidney-disease rarely happens in pure diphtheritic intoxication, but much more frequently when the *bacillus diphtheriæ* is in combination with the streptococcus.

Notes on Fifty-Eight Cases of Hemorrhagic Diphtheria. (*British Medical Journal*, March 30, 1895.) By Harold Austen, M.D., and Harry Cogill, M.D.

Very little is said of this variety of the disease in the literature of diphtheria, notwithstanding the fact that cutaneous hemorrhages influence the prognosis to a considerable extent. Of six hundred and eighty cases of diphtheria treated at the Western Fever Hospital at Fulham during the years 1893 and 1894, fifty-eight, or 6.59 per cent., presented cutaneous hemorrhages. All of these cases except one proved fatal. The cutaneous hemorrhages were of two varieties: (a) Ecchymoses, circular or oval in shape, varying in size from an area of two lines in diameter in the smallest

to two inches in the largest, very closely allied to traumatic bruises, and occurring on the face in twenty-three cases, on the extremities in thirty-six, and in forty-three on the trunk. (b) Purpuric spots, varying from minute petechiæ to hemorrhages the size of a split pea, were found on the trunk in twenty-three cases, on the extremities in nine, and in one on the face. The ecchymoses were more commonly found on the extensor surfaces, but the purpuric spots showed a preference for the flexor surfaces. The two varieties were combined in sixteen cases. Hemorrhages from the mucous membranes consisted of epistaxis in eighteen cases, hæmatemesis in ten, and melæna was noted in two cases. In over fifty of these cases the hemorrhage appeared before the ninth day. Death usually occurred within forty-eight hours after the appearance of the hemorrhage, and thirty died within twenty-four hours. In all the cases death was due to cardiac failure, sudden or gradual.

The autopsies showed that internal hemorrhages were most frequent in the thoracic cavity, being often found in the visceral layers of the pericardium and pleuræ. Extravasations were invariably found in the loose tissues around the aorta, œsophagus, and trachea. In the alimentary canal hemorrhages were found in the lower part of the œsophageal mucous membrane, in the stomach, and less frequently in the intestine. The kidneys were rarely affected; the spleen and liver invariably appeared normal; hemorrhages into the muscles were frequent.

The authors remark that hemorrhagic diphtheria presents analogies to the hemorrhagic varieties of the other specific fevers tending rapidly to a fatal issue, profound changes in the blood being set up by the circulation of toxic products. In diphtheria, the disease being primarily local and the general manifestations secondary, the course is more prolonged. Degenerative changes in the blood-vessels have been found by Oertel, and may determine the seat of hemorrhage.

Primary Diphtheria of the Lips and Gums. (*Johns Hopkins Hospital Bulletin*, February, 1895.) By Simon Flexner, M.D., and Herbert D. Pease, M.B.

The authors report two cases in which were found, post mortem, membrane and exudate on the lips, gums, and teeth in one case, and on the lips in the other. The subjects had been admitted to the hospital wards and treated for other diseases, and this formation developed while the patients were in the institution. In both cases bacilli were found closely resembling the bacillus diphtheriæ in morphological and culture characteristics. The patients had been treated—one for arterio-sclerosis and chronic nephritis, the other for tuberculosis of the lungs and chronic nephritis. The occurrence of the bacilli in the membrane and exudate, neither of which was typically diphtheritic, is interesting to note, since neither of the patients presented symptoms referable to the Lœffler bacillus. No other focus of diphtheria existed in the body, as far as could be determined. The

pharynx and larynx were both free from exudate or membrane; and thus, while it must be assumed that in these cases the diphtheria bacilli often reached the mucous membrane of the pharynx, it must be admitted that arriving there they did no damage. The cases present interesting examples of polyinfection with bacteria, and are additional examples of multiple and terminal infections with bacteria in the course of chronic diseases. The significance of the cases in which the bacillus diphtheriæ was found in the bodies, with absence of the symptoms which usually accompany its presence, consists in the danger to more susceptible individuals with whom such an infected case may come in contact.

Blood Examinations Regarding the Malarial Origin of Herpes Zoster. (*New York Medical Journal*, April 6, 1895.) By James M. Winfield, M.D., of Brooklyn.

It has been suggested that herpes zoster is of malarial origin, since it has been observed that many of the patients treated for this disease come from notoriously malarial districts, and that the administration of quinine would mitigate the severer symptoms. Eight cases are reported in which the zoster occurred after or during an attack resembling one or other of the forms of malarial fever. Four of the cases presented the plasmodium in the blood. In two of the cases in which the parasite was not found the patients had been taking quinine. In the other two the patients had presented symptoms suggestive of paludism. The plasmodium perhaps produces the eruption by clogging up the terminal arteries, perhaps by some localized toxic effect on the intervertebral nerve ganglia, or perhaps by a general toxæmia.

Rupture of an Aortic Aneurism into the Superior Vena Cava. (*Edinburgh Medical Journal*, April, 1895.) By Alexander Bruce, M.D., F.R.C.P. (Ed.), of Edinburgh.

The patient was admitted to the Royal Infirmary, Edinburgh, suffering from great shortness of breath and cyanosis. He gave a history of cough, cyanosis, dyspnœa relieved by bleeding, and œdema. He had had syphilis; but said that there had been no extra exertion of any sort. On the day of admission a continuous, loud, "swishing" murmur, somewhat resembling a venous bruit, was heard with maximum intensity on the sternum at the level of the third costal cartilage. A week after admission he had a sudden attack of dyspnœa with cyanosis which gradually passed off, and the following day the murmur was heard with maximum intensity at the sternal end of the second right costal cartilage. The patient died eighteen days after admission, and at autopsy an aneurism of the ascending portion of the aorta was found. This tumor was adherent to the superior vena cava, which vessel it had pushed backward. There were two perforations into the cava, the lower one, old, with rounded edges, the upper one, new, with ragged edges. The point of greatest interest in the case is the sudden

change in the area at which the murmur was heard with maximum intensity. It is probable that the second perforation took place a week after admission, with the accompaniment of dyspnœa and cyanosis as above stated.

The Nature of Gastro-Enteritis in Infants. (*Lancet*, February 16, 1895.)

From examinations of a number of infants suffering from gastro-enteritis, conducted in Professor Epstein's clinic at Prague, A. Czerny and P. Moser think that this affection is to be regarded as a general affection of intestinal origin. It is, therefore, different from dyspepsia, in which the disease remains limited to the gastro-intestinal tract. Thus, out of fifteen cases of gastro-enteritis in which the blood was examined during life, in twelve the presence of micro-organisms was ascertained. On the other hand, in only two out of thirty healthy children were cultures obtained from the blood, and of eleven infants suffering from dyspepsia only one yielded that result. The microbes found floating in the blood in the subjects of gastro-enteritis comprised staphylococci, streptococci, bacterium coli commune, bacillus pyocyaneus, and bacterium lactis aërogenes, all of which are known to occur in the intestinal contents. It is pointed out that this variety in the organisms concords with the multifariousness of the symptoms of gastro-enteritis, while it shows that prophylactic measures are more hopeful than therapeutical, the value of which latter must depend upon the kind and intensity of the general infection.

THERAPEUTICS.

IN CHARGE OF ALEXANDER D. BLACKADER, B.A., M.D.,

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ASSISTED BY

D. J. EVANS, M.D.

On the Modern Treatment of Pulmonary Tuberculosis. (*New York Medical Record*, April 6, 1895.) By Carl von Ruck, M.D.

In a paper read before the County Medical Association of New York, the author emphasized the importance of the general management of the patient, so as to secure and maintain the highest possible degree of general and local nutrition. Careful attention must also be given at all times to the organs of circulation, digestion, assimilation, and secretion. Exercise, amusements or light occupations, reading, mental states, clothing, position in sitting or reclining, exposure to variations of temperature, are all matters for watchfulness and advice. The employment of climate treatment, one of the most important for the arrest of the disease, means that we seek pure

air, as free as may be from micro-organisms; sufficiently dry, so that the functions of the skin are under the most favorable conditions; in a locality which by its elevation improves the circulation, and with the conditions of temperature which favor an out-door life and an increased solar exposure.

In reference to specific treatment, he is very certain that an important step forward has been taken by Professor Klebs in the separation from tuberculin of the germicidal principle, a substance resembling in its chemical reaction a deuterpepton, leaving behind toxic substances which apparently exert no curative influence, and to which the disturbing effects of the tuberculin are due. It would appear that this new substance, to which the name of antiphthisin is given, represents the curative properties of tuberculin. It is non-poisonous in doses much larger than are required of tuberculin to cause the death of an animal in twenty-four hours, and under its use guinea-pigs show involution of the tubercular tissue, increase in weight, and recover entirely, when treatment is sufficiently active and prolonged. The author is at present repeating these experiments of Professor Klebs, and, so far as he has gone with them, finds them confirmed by his own results.

He recognizes the difference, however, between tuberculosis as met with in our patients and in experimental conditions in animals. Even if antiphthisin prove a true specific germicide, we can only expect to reach the bacillus in living tissue, and its effect under the same dose must be in proportion to the vascularity of the part. The remedy should give the best results in recent tubercular disease in the lung. Cheesy masses or fibroid nodules would remain uninfluenced. Fibroid changes and formed cavities cannot be made to disappear by the use of a germicidal remedy. The destruction of the bacillus upon the surface of cavities and localities where necrosis has already occurred, is more difficult, owing to their only slightly vascular base. After a year of clinical experience at Asheville, during which he has treated nearly a hundred patients with antiphthisin, he reports that his conviction of its clinical value has steadily grown stronger. He has had very encouraging results in acute cases, and in the early stages of the chronic form, and recommends its trial by the profession, especially as he has not seen the slightest indication of any harmful incidental effect.

On the Use of the *Solanum Carolinense* in the Treatment of Epilepsy. (*Medical News*, March 30, 1895.) By E. D. Bondurant, M.D.

The writer reports that during the past five months he has given this new remedy a trial in the treatment of eleven epileptic insane patients in the wards of the Alabama Insane Hospital. All of the patients had been previously under daily observation for some time, and the general character of each case as well as its reaction to other anti-epileptic agents was fully known. The results obtained were not encouraging. In four cases no visible effect was produced; in four others there was an apparent increase in the number of convulsions during the time of treatment; in the remain-

ing three, while little or no effect was observed during the time of administration, there was a marked increase in the number of fits during several weeks following the stoppage of the medicine. The drug was otherwise well borne, but in none of the patients was the mental condition or bodily state in the least benefited. While he admits that his class of patients present the disease in the form the least amenable to treatment, nevertheless most of this class may be temporarily benefited by not a few of the better known anti-epileptic remedies. Scarcely any line of treatment heretofore employed has given such unfavorable results as has the use of the solanum.

Ferripyrin. (*Therapeutische Monatschrift*, February, 1895; also, *Münchener Medicinische Wochenschrift*, No. 1, 1895.)

This new drug, which has been recently introduced to the profession, is a combination of perchloride of iron and antipyrin. The credit for its introduction is claimed by several writers. It is an orange-colored, readily-soluble powder, recommended as a hæmostatic and local astringent without the caustic effects of the perchloride. Hedderich states that it is absolutely non-irritating and non-destructive to the tissues. When applied to the nasal mucous membrane in a twenty per cent. solution, it is a mild anæsthetic, but the powder itself may also be applied. Its use in hæmatemesis and in urethral blennorrhagia is suggested. It has also been employed for its constitutional effects in chlorotic and anæmic conditions, and may be used with benefit in such cases as are accompanied by neuralgic conditions. It has also proved of service in chronic catarrhal diarrhœas. The dose is from three to eight grains three times daily, and it may be combined with hydrochloric acid, pepsin, and tinctures free from tannin.

Therapeutical Effects of Beta-Naphthol Bismuth. (*New York Medical Journal*, March 30, 1895.) By Hugo Engel, M.D.

The writer calls attention to the value of this combination of naphthol with bismuth. From the experiments made in Professor Nencki's laboratory at St. Petersburg we learn that beta-naphthol bismuth, when given internally, is decomposed partly in the stomach and partly in the small intestines. The naphthol appears only to a very small extent to be absorbed and eliminated with the urine. In no case were any toxic symptoms observed. Professor Hueppe also strongly recommends this drug as a powerful intestinal antiseptic, which is well borne by patients even when continued for a long while, and in this statement he has been corroborated by other observers. Dr. Engel reports his success with the drug in a considerable number of cases, both children and adults. It far surpasses in his opinion the older preparations of bismuth as an antiseptic astringent, and can be given with impunity in sufficiently large doses and for a sufficient length of time to insure the cure in most cases of disease due to the presence of pathogenic bacteria in the alimentary canal.

The Value of Electrical Treatment. (*British Medical Journal*, March 30, 1895.)

In a short editorial notice attention is called to the remarks made by Mr. Victor Horsley in his lecture at the London Institution on electrical currents in the living body and the therapeutic uses of electricity. While admitting that it is useful as a means of stimulating the activity of nerve and muscle, he was not inclined to credit it with much more value. After mentioning that nutrition may be beneficially affected in certain cases, he said that the use of electricity for this purpose was quite empirical and arbitrary, without scientific evidence to prove that there was any quantitative acceleration or increase of tissue-changes in the manner indicated. D'Arsonval, however, has shown experimentally that the metabolic processes of the body can be largely modified and increased by electrical currents. Debedat, in some experiments on rabbits, has obtained clear evidence of the effect of electricity upon muscular growth, and Fruchot has published experiments showing a marked effect produced by electrostatic charges upon himself. Although the construction of a scientific basis for medical electricity is not yet being far advanced, it is none the less in progress. The chief need at the present time is for more investigation, and for a more general sympathy with a branch of medical treatment which has hitherto been unfortunate in the manner it has been exploited by ignorant pretenders.

The Therapeutic Action of Lactophenin. (*Zeitschrift für Heilkunde*, vol. xvi., No. 1.) By Franz Riedl, M.D.

From a study of thirteen cases of acute articular rheumatism, two cases of erysipelas, four cases of croupous pneumonia, eleven cases of acute phthisis, seven cases of pleurisy, and five cases each of headache, neuralgia, sleeplessness, delirium, etc., with fifty-five cases of typhoid fever, the mortality being 7.27, Riedl finds that lactophenin is for the greatest part a sure-acting antipyretic, and that it acts specifically in acute rheumatic affections of the joints. In erysipelas, pneumonia, and sepsis its use has scarcely any influence upon the intensity or the duration of the disease. In typhoid fever it nearly always prevents hyperpyrexia. It is *not* a specific against this disease. Subjectively, the patients were better under its use, delirium being a rare occurrence. The untoward actions are few. As far as any injury to the human organism is concerned, through the continuous use of this drug, whether the diseased process is shortened or lengthened, or in reconvalescence, it is the best antipyretic we possess.

A Study of the Mode of Action of Ichthyol in Inflammatory Conditions. (*Therapeutic Gazette*, March, 1895.) By D. Braden Kyle, M.D.

At the request of Professor Hare the writer undertook a research to determine what changes were produced in an inflamed area by the use of ichthyol, as its apparent power in producing absorption of inflammatory exudations renders it important, if possible, to place its use on a rational

basis. Having produced inflammation in the subcutaneous tissues of a rabbit by trauma, the affected parts were treated by rubbing alone, by rubbing with lanolin, and by rubbing with a mixture of ichthyol and lanolin. The animals were then killed, and sections of the parts were prepared, stained, and examined under a microscope. The following results were noted: In the tissue where rubbing alone was used, the inflamed area was less dense than in those areas where no massage had been employed. The parts rubbed with lanolin alone showed no difference, except the presence of the oil-globules. The parts rubbed with ichthyol showed the inflammatory exudate distinctly less dense, more diffused, and slightly granular, the leucocytes fewer and smaller, the tissue-spaces more open. The tissue was also more deeply penetrated with the globules of ichthyol than with the globules of lanolin. It is inferred that the rubbing and ichthyol distinctly assist the removal of inflammatory exudation, lessening extravascular pressure, and promoting circulation, and thus hastening absorption.

SURGERY.

IN CHARGE OF HENRY R. WHARTON, M.D.,

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AND

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Temporo-Sphenoidal Abscess; Recovery. Sarcoma of Brain; Removal. Exhibition of Patient Four Months after Operation. (*Australian Medical Journal*, February 20, 1895.)

At a meeting of the Medical Society of Victoria, Dr. Moore described the case of a girl, aged nine, in whom a temporo-sphenoidal abscess following middle-ear disease was successfully treated by drainage, and Mr. Syme exhibited a patient from whom an encapsulated sarcoma of the dura mater, weighing two and a half ounces, and pressing—on the left side—on the lower part of the ascending frontal and posterior part of the second and third frontal convolutions had been removed. Four months after the operation the paresis of the face and of the tongue is very slight; speech is good; patient writes perfectly; has no pain, no fits, and feels able to resume duty. There was no history of syphilis, and an absence of optic neuritis is noted.

The Flaxseed-Meal Poultice as a Sterile Dressing. (*Boston Medical and Surgical Journal*, April 4, 1895.) By R. W. Lovett, M.D., of Boston.

The writer considers that the flaxseed-meal poultice is of undoubted utility in many conditions, and he has made seventeen experiments to deter-

mine whether this form of dressing is a sterile one. Cultures were made from poultices prepared in the usual manner, and also from others made under great precautions. The meal was boiled from three to five minutes, and in one instance for ten minutes, although sterilization for ten minutes or more is impracticable, for the meal is thereby reduced to a gelatinous mass unfit for surgical use. Colonies of bacteria were found in the majority of instances, and precautions in preparation cannot, therefore, be relied on to render the poultices sterile. The organisms were cocci and bacilli of various forms, and, as a rule, are probably non-pathogenic. The colon bacillus was, however, identified in several cultures.

A Case of Cystitis, Pyelonephritis, and Pyonephrosis due to Colon-Bacillus Infection. (*Journal of Cutaneous and Genito-Urinary Diseases*, April, 1895.) By F. Tilden Brown, M.D.

In connection with the report of this case, specimens of septic kidneys were shown and a history of the cases given. In these three cases of pyonephrosis the only lesions seen by gross and microscopical examination were those of a septic nature, and bacteriological examination of the urine and kidneys gave pure cultures of the *bacillus coli communis*.

In the first case a history of broncho-pneumonia and an accident with a strain of the left side was elicited. Attacks of cystitis came on, and later a pyonephrosis which necessitated removal of the left kidney. Cultures made from the urine and from the kidney immediately after removal showed pure growths of the colon bacillus. The urine examined three months after the operation showed the same growth. In the second case, a woman, twenty-five years of age, had suffered from attacks of pain in the left side for three years. In the second month of pregnancy she was suddenly attacked with severe pain in the region of the left kidney, obstinate vomiting, and fever. An extra-peritoneal nephrectomy was performed and an enlarged septic kidney removed. Cultures made from the superficial and deep portions of the kidney gave the colon bacillus only. A culture from the urine six months later showed the same organism. In the third case a cystitis and pyelitis of the left side were diagnosed by the cystoscope. The pus-laden, acid urine afforded no growths on various media, and inoculation of a guinea-pig proved negative. Symptoms of sepsis appeared and a nephrectomy was performed. Cultures made from the surface and deep portions of the kidney gave the colon bacillus. Eight months later the urine was tested and a pure culture of the same organism obtained.

The author calls attention to the following facts: In these cases there was clinical evidence of a diseased condition of one kidney, and, upon removal, septic lesions were found, with no other ascertainable cause but the colon bacillus. The general health and weight of each patient improved after operation. The colon bacillus persisted in the urine long after recovery. In two of the cases the gross septic lesions of the kidney were mainly on the surface, suggesting an arterial deposition of the contagion rather than

a urethral ascension. From these facts the author infers that the colon bacillus, under certain circumstances, becomes pathogenic when it gains access to the kidney either by the blood or by the ureter.

Report of a New Method of Examining the Rectum and Sigmoid Flexure. (*Mathews's Medical Quarterly*, April, 1895.) By Otto Ramsay, M.D., of Baltimore.

The method is the one in vogue at the clinic of Dr. Howard Kelly. The instruments are, first, a sphincterscope four centimetres long; second, a proctoscope fifteen centimetres long; third, a proctoscope twenty centimetres long; fourth, a sigmoidoscope thirty-five centimetres long. These instruments are provided with obturators to facilitate their introduction into the bowel. A blunt cone is used to dilate the sphincter for the introduction of the larger specula; applicators of copper wire, a sponge-holder, and a small, long-handled scoop for removing fæcal matter complete the outfit. The patient is placed in the knee-breast posture; the speculum, with obturator in place, is inserted with a slight, boring, rotary motion; the obturator is withdrawn, and the wall of the bowel can be readily examined as it collapses about the end of the speculum as the instrument is withdrawn. Applications can be made at any point. An anæsthetic is not necessary. The bowels and bladder should be empty before the examination is made.

The Medical Treatment of Reducible Herniæ and the Remote Results. (*Deutsche Zeitschrift für Chirurgie*, 1895, vol. xl., Nos. 3 and 4.) By S. Beresowsky, of Moscow, March 22.

This author wishes to solve the questions, in what cases are trusses most useful and necessary? what are the indications for operative treatment? and what is the best method of performing the operation,—namely, which operation is most harmless for the patient on account of its more certain remote results and least complicated technique?

With the purpose of answering these questions he studies most carefully the one hundred and sixty-one cases occurring in the clinical service of Professor Kocher, of Berne, in which there were two hundred and twenty herniæ. He also studied results from other methods as well as those obtained by Professor Kocher's various methods. From these studies he arrives at the following conclusions:

1. The only indication required for operation, in the present state of the radical operation as performed in the Berne clinic during 1892 and 1893, is the desire of the patient to have the operation, or at least that is sufficient.
2. The size and age of the hernia influence the prognosis only as regards the length of the period of recovery and, in the majority of cases, the frequency of relapse.

3. The age of the patient—*i.e.*, the flabbiness of the abdominal walls—influences in no measure either the result of the operation or the rapidity of the healing, yet it has a somewhat greater influence on the prognosis as regards return. More frequently in these cases the actual hernia does not return, but another is formed in some other locality, having no relation to the operation and resulting from the relaxed condition of the abdominal walls.

4. In the case of children the operation can be performed even early in life; but the following aseptic principles should be carefully attended to: If possible the wound should be hermetically closed; the stitches of the continuous suture should be close together; no drainage should be used; before the gauze is laid over the suture it should be painted with a mixture of subnitrate of bismuth and bichloride solution; then the wound is closed by collodion. The relapses seen are not so frequent as the non-curable cases in treatment by trusses.

5. The best method of treatment of oblique inguinal herniæ is the latest modification of Kocher's method, since it gives more certain results of a permanent character than the other best-known methods (Macewen, Bassini), and, secondly, since this method, on account of the simplicity of its technique and the slight danger to the patient, in cases where there is a disturbance in the healing process, has noteworthy advantages over other methods.

6. To prevent the possibility of a relapse care should be taken not to injure the veins of the cord, and in cases where a varicocele occurs the operation for its radical cure should be immediately undertaken.

7. The wearing of a truss after healing by primary union this author considers to be entirely unnecessary.

Suturing of the Diaphragm. (*Bull. della Soc. Lancisiana*, XIII. Year, No. 2, p. 134.) By E. Ballerini, Rosini, L. Saraiva, and O. Manara.

These authors report five cases of wounds to the diaphragm which were afterwards sutured. Ballerini's case was that of a thirty-nine-year-old working-man who received an oblique punctured wound, five centimetres long, in the sixth left intercostal space. Notwithstanding the injury he was able to go from Ostia to the hospital at Rome. By means of resecting the sixth rib the wound was extended, the pleura incised, and a four-centimetre-long wound was discovered containing omentum in the diaphragm in the neighborhood of the pericardium. By means of this opening the stomach was examined and found to be intact. The diaphragmatic wound was sutured, as well as the external wound. Healing was complicated by emphysema, Estlander's operation having to be performed.

Rosini reports two cases. The first case had a wound in the seventh, and the second in the eighth left intercostal space. In both wounds the omentum was found, and after its removal the diaphragmatic wound was

closed by means of a double row of sutures. Healing took place without any complication in fifteen and eighteen days, respectively.

Saraiva reports a very similar case. The wound was in the eleventh left intercostal space, the omentum also occupying the opening in the diaphragm.

Manara's patient was twenty-nine years old, with a wound in the seventh left intercostal space. After resection of the eighth and ninth ribs the wound in the diaphragm was discovered, and salad and other articles of food were found in the pleura. After extending the diaphragmatic wound the one in the stomach was sutured. Though a persistent pleurisy followed, complete healing took place, the patient being alive four years after the operation.—*Centralblatt für die medicinischen Wissenschaften*, March 30, 1895.

Hairy Concretion in the Stomach. (*Intercolonial Quarterly Journal of Medicine and Surgery*.) By W. Blaxland, F.R.C.S., of Broken Hill, N. S. W.

The author removed from the stomach, in a girl aged nineteen, a hairy concretion, kidney-shaped, its dimensions being approximately five and one-fourth inches by two inches, its weight being within a few grains of five ounces avoirdupois. The patient had been in the habit, for six years, of biting off and swallowing hair. During recovery from operation the only untoward symptom was an elevation of temperature to 104° F. The patient, while asleep, made several attempts to draw her hair to her mouth.

Gastrostomy by Frank's Method. (*Berliner klinische Wochenschrift*, 1895, No. 8.) By H. Lindner, M.D.

The author has used this method in nine cases. The operation was eminently successful; there was no overflow either of food or gastric juice to hinder the healing, which took place rapidly. One case died on the eighth day after operation. The case, however, was one in which the operation was done as a last resource. Two other patients died ten and twelve days respectively after operation from pneumonia. One case was a septic pneumonia supposedly, but the autopsy proved it to have been due to a concurrent influenza. The autopsy also showed the utility of the operation, and that it had accomplished its purpose. Of the remaining six cases, four left the hospital in a much improved condition. One who had suffered from a stricture of the œsophagus, due to a corrosive substance swallowed, was entirely healed in one hundred and forty-two days; the others twenty, thirty-seven, and thirty-nine days after the operation. One of the cases died soon after returning home; another was lost sight of and probably died; a third is still living—three months after operation—with a retentive fistula that does not require a bandage. The two patients that remained in the hospital died, one two and the other one month after operation. In one case the patient recovered entirely; the œsophagus was

dilated by the passage of sounds from the stomach upward, and the final closure of the fistula. Frank's method of gastrostomy consists in an incision over the stomach, the drawing out of as large a portion of the stomach as possible, and the fixation to the peritoneum of the portion drawn out. A second incision is made two fingers' breadth beyond the costal margin, the skin intervening between the two wounds is undermined, and the free portion of the stomach drawn through this canal, fixing it in the second wound, where it is then opened and the fistula established. The operation, if performed under favorable circumstances, offers not only relief from the present distressing symptoms, but also a chance for twelve months of comfortable life.

Lodgement of a Foreign Body—a Pin—in the Appendix Vermiformis; Death from Pyæmia. (*Canadian Practitioner*, March, 1895.) By A. McPhedran, M.D., and J. Caven, M.D.

An interesting history is given of a man, aged twenty-one, who entered the Toronto General Hospital on November 15, 1893, with severe pain in the right side, costal breathing, tenderness over the seat of pain and also over the abdomen at three points,—in the right iliac fossa, above the umbilicus, and to the left and below the umbilicus. On the third day he had a chill, and from that time he had a chill almost every day for six weeks, the temperature rising sometimes to 106.4° F. Pleurisy developed, but no pus was obtained on aspiration of the pleura on two different occasions. In December the right ankle became swollen, and some thin pus was obtained by aspiration. On February 12, he coughed up six fluidounces of offensive pus. Diarrhoea now became troublesome, and pus appeared in the urine. Death took place on March 10, 1894.

At the autopsy a small pus-cavity was found in the right pleura which connected by an opening in the diaphragm with an abscess in the right lobe of the liver, and also with a bronchus in the upper lobe of the right lung. Several recent abscesses were found in the liver. The appendix vermiformis was the seat of an old inflammation. In the dilated extremity, beyond a cicatricial contraction, a large-sized common pin was found. The tip was embedded in the appendical wall; the pin was bent and covered with a layer of calcareous matter. No signs of recent inflammation were seen.

The authors think that the presence of foreign bodies in the appendix is more rare than reports would indicate. An examination of these supposed foreign bodies often reveals lime-impregnated faecal concretions which simulate various seeds, etc. Even gall-stones and worms are rarely found in the appendix. Instances of pyæmia with liver abscess due to ulceration of the appendix are recorded, and the authors quote instances of five cases of pin in the vermiform appendix. Only one of these cases agrees with the authors' in its results and termination. Ashby reports a case in the *London Lancet* of 1879, in which there was pyæmia with liver abscess, no statement of a local infection being made.

NEUROLOGY.

IN CHARGE OF LANDON CARTER GRAY, M.D.,
New York City,

GUY HINSDALE, M.D.,
Philadelphia,

AND WILLIAM BROADDUS PRITCHARD, M.D.,
New York City.

A Case of Agoraphobia. (*The New York Medical Journal*, March 30, 1895.) By Merille Taylor, M.A. (Cantab.).

A man, twenty-six years of age, consulted the author for attacks which come on when he is about to cross a street or square, or is left alone in any large open space. He describes them as "horrible feelings of fear with palpitation of the heart." He has always had good health, is temperate, eats and sleeps well. The heart and other viscera are healthy, the reflexes normal. There is no insanity, hysteria, or any other neurosis in the family history. The writer thinks that this case belongs to that class of mental deviations described under the head of "imperative ideas." Ribot divides fixed ideas into three classes: 1, simple fixed ideas of a purely intellectual kind; 2, fixed ideas accompanied by emotions; 3, fixed ideas of the impulsive kind. Verga describes cases of "claustrophobia," "acrophobia," and "astrophobia." Carpenter quotes an instance of "paralysis of the will." The French term for this condition is *le peur des espaces*. Krafft-Ebing regards this condition as an expression of an irritable weakness of the nervous centres, founded on a neurasthenic basis, constitutional or acquired. Westphal regards these attacks as allied to "epileptic vertigo." According to Cordes, the primary cause is a paresic exhaustion of the motor nervous system of that portion of the brain which governs not only locomotion but muscular sensibility also.

Some New Observations upon the Causes, Mode of Onset, and Prognosis of Apoplexy. (*Medical Record*, February 23, 1895.) By Charles L. Dana, M.D.

These observations were made from a study of one hundred consecutive cases of apoplexy with hemiplegia, and eighty-two cases of apoplexy with autopsy. One-third of the cases were in females.

In his conclusions the author wishes to emphasize the fact that apoplexy and hemiplegia occurring in early adult life are much more frequently due to syphilis than to embolism, and that syphilis is a factor in a third of all apoplexies, at least in large cities. The apoplexies are increasing in disproportionate frequency, owing partly to the facts that more people live to the apoplectic age, and that there is a larger urban population, with all which that implies in regard to the use of alcohol, the prevalence of syphilis, and the greater intemperance in eating and working.

Apoplexy does not especially affect brain-workers if they live temperately, but rather spares them. The special facts regarding the mode and

time of onset of apoplexies are summarized as follows: Of all exciting causes of fatal strokes alcohol is the most potent. Very few attacks take place, as is currently supposed, during some especial mental or bodily strain. None of the fatal hemorrhages occurred during sleep, and the author doubts if arteries really rupture at that time. The frequency with which attacks occur in the morning after breakfast, or in the evening, is somewhat noteworthy. In cerebral hemorrhage prodromata are rarely noted. In a few instances persistent headache, cerebral paræsthesia, vertigo, disturbance of sleep, and sensations of fulness about the head are described. It is mostly in cases of thrombosis that prodromata are described, and these consist of headache, temporary aphasia, vertigo and syncopal attacks, slight temporary hemiplegia, insomnia, a sense of oppression, etc.

Apoplexy is sometimes a conservative agent, calling a halt to excessive activity and intemperate living, and actually prolonging life. About one-fourth of those stricken with apoplexy die from the attack (hemorrhages being the most dangerous; thrombosis, especially syphilitic, being least so). The average duration of life of those who have and survive one attack is over five years. Thromboses are much more apt to recur than hemorrhages.

On a Case Presenting Symptoms of Cerebral Tumor in which a Large Area of the Skull was removed for Relief of Intracranial Pressure. (*British Medical Journal*, April 13, 1895.) By J. Mitchell Clarke, M.D., and Charles A. Morton, M.D.

The symptoms of intracranial tumor were optic neuritis, headache of very intense character, vomiting of cerebral type, and epileptiform convulsions, with failure of memory and impairment of the mental faculties. These symptoms had slowly increased for two years. The man had had syphilis nineteen years before, making possible the presence of a syphilitic neoplasm, but two courses of antisyphilitic remedies had been tried without effect. In order to relieve the intense headache and optic neuritis, without an idea of seeking for the growth, an operation was performed. An area of bone having a diameter of two and a half inches was removed in three portions, by means of a one-and-a-half-inch trephine, from the parietal eminence and portion of skull immediately below and behind it. The dura mater then projected slightly beyond the margin of bone around the large opening and pulsated distinctly. The flap was replaced and sutured. The patient made a good recovery, and on August 14, twenty-five days after the operation, left the hospital. Subsequently he remained quite free from headaches and sickness, his sight improved, and the optic neuritis subsided, leaving the disks white and partially atrophied.

On January 5 he was taken with general convulsions and had twenty-four the following night, the intervals of consciousness between the fits lasting from twenty to thirty minutes. His head had been affected for several days before the fits came on, the scalp over the trephine opening was more bulging, and showed marked increase of pulsation. He was admitted to

the hospital, but did not have a return of the convulsions nor any other bad symptom. On January 24 the bulging and pulsation had become much lessened, his memory and intelligence seemed unimpaired, and he was free from headache and vomiting. He now complains of bad sight, but this defect is not great as regards central vision, although there is contraction of the visual folds.

A Case of Locomotor Ataxia with Persistent Knee-Jerks. (*American Medico-Surgical Bulletin*, April 1, 1895.) By Follen Cabot, M.D., of New York.

The author reports a case presenting the symptoms of locomotor ataxia. The knee-jerk was present, and was brought out more distinctly by reinforcement. There was no ankle clonus. Patient improved on sulphate of strychnine and dilute phosphoric acid.

Neuritis believed to be Due to Poisoning by Carbon Monoxide. (*British Medical Journal*, April 6, 1895.)

Dr. T. R. Glynn records the case of a boy, aged sixteen years, who, when admitted to the Liverpool Royal Infirmary, was quite unable to walk, and had been confined to his bed for five months. He was an engine-cleaner and worked in a shed where twelve engines were cleaned every night. In this shed there was a furnace from which he had to carry red-hot coals to start the engine-fires. He found the fumes from the fires very irritating. For five months he had pains in his calves, and a month later dyspnoea on exertion, and swelling of the legs. His urine became albuminous and he lost all power in his lower extremities. On admission there was weakness of the muscles of the legs and especially the extensors of the feet; tenderness of the muscles and loss of faradic irritability; some loss of sensation and paræsthesia; knee and plantar reflexes absent; marked spasm of gastrocnemii. There was no dyspnoea or anæmia; the amount of hæmoglobin and the number of red cells were normal. In the hospital the patient rapidly improved under iodide of potassium and hot fomentations to the legs. He recovered the power of walking, but the extensors were weak and the knee-jerks absent.

Lead Convulsions. (*American Journal of the Medical Sciences*, March, 1895.) By D. D. Stewart, M.D.

This writer says that of the various forms of cerebral disorder produced by lead, conjointly designated encephalopathia saturnina, the convulsive is by far the most common, forming two-thirds, if not more, of all cerebral manifestations. He prefers the term convulsions rather than eclampsia or epilepsy, for it includes all of the various forms of convulsive disorders of lead origin. A clinically exact systematic grouping of the various forms he thinks impossible, for the eclamptic and epileptic forms may each blend with the other. A distinct class does exist, of which two instances are

given, in which the primary lead convulsion becomes secondarily "idiopathic" epilepsy.

The duration of the period between the first exposure to lead and the development of cerebral symptoms is a variable one, depending upon inherent susceptibility and severity of poisoning. In this series of sixteen cases the convulsions appeared earliest in children. In one of the cases convulsions appeared on the fifteenth day after exposure; in thirty-two days in a second, thirty-three days in a third, a trifle less than four months in a fourth and fifth, four months in a sixth, about eight months in a ninth, and in the tenth the period of exposure extended over a period of some twenty years.

None of these cases was engaged in the manufacture of lead compounds. One was a coach-painter who for a year preceding the convulsions had used chrome colors. Two were handlers and mixers of chrome yellow in a dye-house. Two were bakers who used chrome yellow as a cake-dye. The remaining eleven were poisoned by eating the lead-dyed cakes.

Preceding the development of cerebral manifestations the ordinary symptoms of plumbism are usually found, but this appears to depend largely upon the duration of the period of exposure prior to the convulsions. In eight of this series they were present, but in the remaining number, although there was evidence of a depreciation in health, the common symptoms of plumbism were absent.

Paralysis of the extensor muscles of the forearm (wrist-drop) did not occur in any of the sixteen. The blue line was present in all cases examined for it.

OPHTHALMOLOGY.

IN CHARGE OF CHARLES A. OLIVER, A.M., M.D.,

Philadelphia, Pennsylvania,

AND

EDMUND LANDOLT, M.D.,

Paris, France.

Hints Concerning the Performance of the Operation for the Extraction of Senile Cataract, being a Record of Personal Experience. (*Boston Medical and Surgical Journal*, January 31, 1895.) By Hasket Derby, M.D., of Boston.

This most excellent and timely article has been written by one who has had a large experience, extending over many years of practice. For the past thirty years he has kept full notes of all of the extractions of senile cataract that he has made. The purpose of his paper is to present to the younger members of the profession in this special work a *résumé* of his varied experiences during this period of time, and to discuss the best manner of restoring vision to the subjects of senile cataract.

He starts out with the two axioms "that no operation is to be done on one eye as long as the lens of the other is wholly transparent," and "that, save in most exceptional cases, entire maturity is to be awaited."

On this latter point he most properly says, "My own experience leads me to believe that the absence of perfect ripeness invariably diminishes the chances of success in many cases, complicates convalescence, and always renders the satisfactory performance of the operation more difficult." He says, however, "Of course there are occasions on which, of two evils, the lesser must be preferred, and times when it is better to encounter the risk of removing a cataract that is not wholly ripe than to leave an aged patient, who has wholly lost the power of reading and writing, to the depressing effect of enforced idleness."

The matter of prognosis, he says, "is one on which the surgeon is invariably approached, one of the first questions put by the patient or his friends being as to the chances of success. He thinks that it may safely be stated that, in an uncomplicated case of mature senile cataract, occurring in a reasonably healthy patient under or not much past eighty-five, where the cornea is fairly large, the pupil readily dilatable, and the conjunctiva as well as the lachrymal apparatus free from disease, the chances of regaining useful vision are at least eighty-five per cent., while those of total loss of the eye may be estimated at two per cent." He says that where the above conditions are fulfilled, this certainly agrees with his own experience. "We operate," he says, "however, in many instances where they are not, and no law as to the effect of complications on ultimate success can be formulated."

As regards the place of performance of the operation, he sees no reason for departing from the principle that he has always laid down; that it should be away from home, preferably in a private hospital or else in one of the private rooms in a public one. He thinks that care at the hands of attendants and nurses familiar with such operations will thus be secured, while the advantage of a place constructed and arranged for this special purpose must be greater than that afforded by the ordinary private house. "There remains, moreover," he says, "the fact that the patient is removed from the occurrences of home-life, is not annoyed by officious relatives or well-meaning visitors, and escapes possible household troubles and cares." He always prefers that the patient should pass the preceding night in the room in which the operation is to be performed, that he may gain a knowledge of his surroundings before the application of the bandage.

He gives careful rules for the preparations for the operation. He discusses the question of the performance or non-performance of iridectomy, stating that he sees no reasons for departing from the belief, which he has always entertained, that the average patient at the hands of the average surgeon stands a better chance of an uncomplicated recovery, and in consequence thereof of attaining useful vision, if iridectomy be performed. He believes, however, that it is true that great and practised operators obtain excellent results in the vast majority of cases from simple extraction, and

that many of them at this time are inclined to make it the rule, and the combined operation the exception. Even they, he says, must accept the fact that no amount of experience in selecting cases, or of manual dexterity in operating, can enable the surgeon to declare that, in any given case, iris prolapse may not occur. He maintains, therefore, that the young practitioner will do well to combine iridectomy with extraction.

As to the technique of the operation: after cocainization, he introduces a light and easily-managed spring speculum that can be readily withdrawn. The globe is fixed with a rubber-tipped fixation forceps applied just beyond the corneal limbus at a point opposite to the elected point of corneal section. The cut is made at the sclero-corneal junction, and should extend over one-third of the periphery of the cornea, being crescentic in shape. He avoids the formation of a conjunctival flap by turning the blade of the knife forward upon the completion of the corneal cut, and cutting outward as rapidly as possible, fixation being at once and finally desisted from.

The speculum being removed, the capsule is thoroughly incised in different directions with the cystotome, he seeing no advantage in the peripheric opening.

The lens is delivered by pressure made at the base of the cornea through the lower lid by means of a rubber scoop.

He advises delicate massage in preference to irrigation for the beginner, thinking it better to run the risk of allowing a small amount of the lens-matter to absorb. After seeing that the field of operation is thoroughly cleansed and free, he instils a drop of a one-per-cent. solution of eserine into the conjunctival sac before closing the eye. A sterilized bandage is then applied.

As a rule, he operates early in the morning, changing the bandage, washing the outside of the eye with sterilized lint dipped in sterilized water the same afternoon. In uncomplicated cases he repeats this once a day, postponing any examination of the eyeball until the eighth day.

In order to secure dilatation of the pupil he frequently wets small pieces of linen with a solution of atropine and places them directly on the eye; this to be done daily until the opening of the eye. In regard to the claim that only one eye need be guarded, the lids being lightly closed with plaster, and that the patient may be allowed to remain in a light room, and even to use the other eye, he justly replies that undoubtedly some eyes recover under these or even more unfavorable conditions, but that accurate and extended statistics must be substituted for vague assertion before the average surgeon will be justified in so serious a departure from precautions which have stood the test of long experience.

He seldom finds it necessary to confine the patient to bed more than twenty-four hours. On the afternoon of the operation a bed-rest may be used under the shoulders, and a half-sitting posture indulged in,—a change that is always productive of much relief. After dressing the eye the following morning, the patient is allowed to leave the bed and to occupy an

easy-chair. He can then wear a loose wrapper. On the third day the ordinary clothing may be resumed, and a walk up and down the entry allowed, an attendant of course being at hand. He believes that the mild form of mania, that occurs with some old people a few days after the operation, is largely due to the combined effect of darkness and solitude. Hence he thinks pleasant society is always desirable. A friend or attendant should be in the room most of the time, and the patient conversed with or read to as much as possible. At the hospital where he generally operates there are deep windows, with drapery hanging in front of the recess, leaving room for the reader behind the curtain. In other places a screen may be used with a light behind it. After the first day or two he does not regard darkness of the chamber as desirable, a moderate amount of light being allowed to enter. He says that sudden changes of light are to be avoided.

OBSTETRICS AND GYNÆCOLOGY.

IN CHARGE OF RICHARD C. NORRIS, M.D.,

Lecturer on Clinical and Operative Obstetrics in the University of Pennsylvania; Physician-in-Charge, Preston Retreat; Visiting Obstetrician, Philadelphia Hospital; Gynæcologist, Methodist Episcopal Hospital; Consulting Obstetrician and Attending Gynæcologist, South-eastern Dispensary and Hospital for Women and Children.

Intra-Abdominal Shortening of the Round Ligaments for Retro-Displacements of the Uterus. (*Medical News*, March 23, 1895.) By Matthew D. Mann, M.D.

The writer performs the operation as follows: A moderate-sized opening is made in the abdominal wall, and any adhesions that may bind down the uterus are broken up. The patient is then put in the Trendelenburg position, and a large, flat sponge is spread over the intestines. The uterus is pulled up and to one side so as to put the round ligament on the opposite side upon the stretch. The ligament is then seized with two long-handled hæmostatic forceps, the points of seizure dividing the ligament as nearly as possible into three equal portions. A needle threaded with silkworm gut is passed through the loop nearest to the abdominal wall, and under the point where the round ligament is inserted into the uterus, so as to include a considerable quantity of uterine tissue. The loop is then tied to the uterus. A second stitch is passed through the ligament just as it leaves the abdominal wall, and then through the loop in that portion of the ligament nearest to the uterus. The ligature is tied and cut as before. The needle should penetrate the ligament so as to include about two-thirds of it, and so avoid the artery which runs just below the ligament. The same operation is repeated upon the opposite side, and the wound is closed as usual. The writer claims that this operation cannot primarily fail; that

the ligaments can be shortened to any degree required. The uterus is then left in its natural position and supported by its normal ligaments. Should pregnancy occur the uterus is left free to move and to rise as may be required. There are no loops for intestines to enter, causing intestinal obstruction.

The Protective Action of Mucin against Bacteria. (*Centralblatt für Bakteriologie und Parasitenkunde*, March 15, 1895.) By Dr. Walthard, of Berne.

The author has demonstrated by a study of the secretions of the gravid and non-gravid uterus in healthy women that the upper two-thirds of the cervical canal, the cavity of the uterus, and the tubes are, as a rule, sterile, and remain so until the end of pregnancy. Microscopical and cultural researches in four cases of Cæsarean section are included in this study.

The mucus from different portions of the cervical canal gave the following results: 1. The mucus around the external os showed homogeneous mucus, leucocytes, epithelium, and vaginal bacteria. Phagocytosis is observed without exception. 2. A small adjacent portion showed homogeneous mucus, leucocytes with beautifully stained nucleoli, but no bacteria. 3. A portion consisting of two-thirds of the cervical canal and extending to the internal os shows homogeneous mucus, and very seldom cylindrical epithelium with badly stained nuclei. No leucocytes, no bacteria.

A collection of mucus from the third portion of the cervical canal in a gravid uterus was made by which to determine whether the mucus has bactericidal properties, or whether it is an unsuitable medium for bacteria. A glass tube of the form and size of a gynæcological sound, and closed at the end, was passed into the canal and then perforated by passing a copper wire through the tube. It was then attached to a vacuum and a quantity of mucus aspirated. The mucus was spread on sterilized agar-agar and allowed to mix with the water of condensation, and then the tubes were inoculated with different organisms. In twenty-four hours luxuriant growths were found on the agar and also on bouillon mixed with the mucus. Therefore, an antiseptic action of the mucus, in the sense of our chemical antiseptics, is not found. Plates of pure mucus were inoculated with pus organisms and remained sterile after incubation for fourteen days, while control cultures showed luxuriant growths.

Experiments were then made with organisms introduced into the cervical canal. A large, non-pathogenic vaginal bacillus was used. This bacillus, when alive, stained a deep color with Gram's solution, but the dead bacilli did not take up the stain. After remaining in the canal for six hours not much change had taken place. After twelve hours scarcely any stained bacilli could be found, and after twenty-four hours the cervical canal was filled with sterile mucus. During the secretion of fresh mucus, the old secretion and the bacilli were pushed out into the vagina.

The author concludes from these observations that the gelatinous substance of the cervical mucus, owing to the presence of mucin, is an unsuit-

able medium for the growth of bacteria, and, by this means (with the phagocytosis at the entrance of the canal), the infection of the uterus and tubes by the vaginal bacteria becomes hindered in a physiologic manner.

DERMATOLOGY.

IN CHARGE OF W. A. HARDAWAY, A.M., M.D.,

Professor of Skin-Diseases in the Missouri Medical College, St. Louis;

ASSISTED BY

C. F. HERSMAN, A.M., M.D.,

St. Louis.

Keloid from an Unusual Cause. (*Journal of Cutaneous and Genito-Urinary Diseases*, March, 1895.) By J. Block, M.D., of Kansas City, Missouri.

A girl, fourteen years of age, consulted the author in order to obtain relief from a burning and itching of the skin over an area which had been burned by lightning some months previously. The limits of the burn could be readily seen by the pigmentation of the skin, and included the posterior aspect of the neck and upper part of the back, and the lower part of the back and a portion of the nates. An inspection of the surfaces showed the burn to have been superficial, involving only the upper tegumentary layers, there being no scarring. A few months later a number of keloids, elevated above the skin and of a purplish-red color, appeared on the burned surface. Below, above, and to the right of the internatal fold there was an irregular mass with projecting claw-like processes; and to the left the skin was rough, indurated, and red. These new growths were not developed on scar tissue nor were the so-called idiopathic keloids.

The girl had also been struck four years previously, the effect being limited to a transitory paralysis of one of her hands.

Galvano-Faradization of Cicatrices.—Lewandowski (*Medical Week*, February 15, 1895) recommends the following method in extensive cicatrices: A large sponge electrode with a surface of two hundred square centimetres is connected with the positive pole of a galvanic battery and applied to the sacral region. The negative pole is connected with the positive pole of the induction coil, the negative pole of which is connected with an electrode of one hundred square centimetres. The apparatus is supplied with a commutator, so that either the galvanic or faradic current may be used separately or both currents together.

The strength of the current varies. On the average, it should be from three to five milliampères for the constant current, while the induction current should be just strong enough to determine contractions in the muscles supplied by the radial nerve. The active electrode is moved from

forty to sixty times over the cicatrix, especially the red parts, and if there are adhesions about a hundred electro-faradic strokes are made in different directions. Each sitting should last about half an hour, and at its conclusion, if a limb is bound down by contractions, passive motion should be used.

This treatment has been used by Dr. Lewandowski in thirty cases, with the result that in from thirty to sixty sittings the cicatricial adhesions and contractions disappeared while the redness of the scars grew less.

A Case of Congenital Exfoliation of the Skin.—Sangster (*British Journal of Dermatology*, February, 1895) reported the case of a man who was affected with a skin-disease which had first appeared when he was three weeks old. Although his malady was always present, there were three or four attacks each year which reached a high degree of intensity. On examination the skin had everywhere a pigmented look. Extensive tracts of the body, perhaps involving the greater part of the extensor aspect of the arm or the outer side of the thigh, were covered by a harsh, cracked epidermis, much of it thickened and divided into small quadrate areas. Where not so thickened the skin felt thin and paper-like. On picking up the partly detached margin of epidermis a sheet three or four inches square could be peeled off without pain. The surface beneath was grayish-white and smooth, and to the touch slightly sticky. Within a few hours the denuded surface became of a red color and there was a smarting sensation, but nothing like a crust formed and the surface soon paled and became as it was before. There were other parts of the body where spontaneous exfoliation was taking place. The surface presented a ragged appearance, the flakes of epidermis looking as though stuck on. The recently denuded skin looked red but was not thickened. The palms and soles were the only regions not exfoliating, and here the epidermis was thickened and bathed in sweat.

The author believes the condition is a malformation of the skin, and congenital. It is not an ordinary case of ichthyosis, as there is no papillary hypertrophy, which is so constant in the latter affection. The case may, perhaps, represent one of the milder forms of ichthyosis, but these cases are very liable to inflammatory complications, and nothing of this sort was to be noticed in the case described.

Treatment of Warts.—Kaposi (*Medical Week*, February 8, 1895) recommends the following mixture in the treatment of warts:

R Sublimed sulphur, ʒiiss;
Glycerin, fʒviiss;
Pure acetic acid, fʒiss. M.

This mixture is applied once a day to the regions covered with warts, and the growths shrivel up and ultimately disappear.

PATHOLOGY.

IN CHARGE OF ALLEN J. SMITH, A.M., M.D.,

Professor of Pathology in the Medical Department of the University of Texas, Galveston, Texas

AND

HENRY W. CATTELL, A.M., M.D.,

Demonstrator of Morbid Anatomy in the University of Pennsylvania; Prosector to the American Anthropometric Society; and Pathologist to the Presbyterian Hospital, the Institution for Feeble-Minded Children at Elwyn, etc.

Application of the Weigert-Pal Method to Nervous Tissue hardened with Formol. (*Neurologische Centralblatt*, 1895, No. 1.) By Henry Marcus, of Stockholm.

Formol is an excellent agent for hardening tissues, and, as such, can render great service in the preparation of histological specimens. Tissues rendered friable and distorted in Müller's fluid and alcohol become elastic in formol, and keep the normal relations between the different component parts. The pathological alterations appear with greater clearness and distinctness. The method is as follows: A spinal cord prepared as usual is placed directly in a solution of half of one per cent. of formol, where it remains from two to four weeks. A portion of the cord, half a centimetre in length, thus hardened is placed in the incubator in Müller's fluid, at a temperature of 37° C. At the end of eight days it is placed for twenty hours in ninety-five per cent. alcohol, and for the same time in absolute alcohol, mounted in celloidin, and cut. The sections are again placed in Müller's fluid in the incubator and allowed to remain there for even as long a period as eight days, rapidly washed in alcohol, and placed in the Weigert-Pal hæmatoxylin for at least two days, then decolorized, etc., according to the method of Pal. The method is complicated, and the author thinks that this may be in time overcome. The myelin takes a pretty blue color; the degenerated portions remain uncolored. The ganglionic cells remain very distinct, their nuclei coming out clearly.—*Revue neurologique*, March 30, 1895.

Dilution of the Urine Previous to Testing for Albumin, Sugar, and Biliary Coloring Matter. (*Zeitschrift für klinische Medizin*, vol. xxvii. p. 180.) By H. Zeehuisen.

In testing for albumin by means of Heller's nitric acid test, Zeehuisen recommends the dilution of the urine so that its specific gravity is about 1005, in order that any chance of confusion arising from the rings produced by uric acid, resinous substances, etc., may be avoided. The same favorable results are obtained in the reduction tests for sugar, and in Gmelin's and Jolles's (barium method) tests for the biliary coloring matter.—*Centralblatt für die medicinischen Wissenschaften*, March 30, 1895.

MISCELLANEOUS.

Discovery of Helium. (*Lancet*, March 30, 1895.)—The earth spirit allows us to see more and more of the fabric that falls from his whirling loom, and we may perhaps soon be able to gather the scattered threads together and behold the beauty of the great design. After the Faraday medal had been presented to Lord Rayleigh, at the annual meeting of the Chemical Society, on Wednesday, March 27, his coworker in the discovery of argon, Professor Ramsay, was called upon to speak. He announced that in his endeavors to discover the compound of argon he experimented with a rare earth,—clevite, we believe,—which is said to yield hydrogen when acted upon by sulphuric acid. Instead of hydrogen argon was evolved, but associated with some strange gas. On examination this proves to be helium, the latest of all possible elements whose existence, apart from the demands of chemical theory, had only been inferred from the line D_3 in the solar spectrum. It is the first of all the elements, for below this comes the hypothetical "protyle,"—the pre-elementary cosmic stuff from which all the elements are supposed to be condensed. Although this small quantity of helium was found only a few days ago, its existence has been confirmed by Professor Crookes, who has identified its spectrum, the most powerful line being that at a wave-length of fifty-eight thousand five hundred and forty-seven micro-millimetres. This line is almost identical with the well-known yellow sodium lines, and it was Professor Crookes' thought that he had to deal with these; but all the magnifying power at his disposal was incapable of separating the line into two, which confirmed the suggestion that it was no other than the D_3 line in the solar spectrum, and he attributed it to an unknown element provisionally termed helium. A more remarkable vindication of our chemical theories than this it would be difficult to find, and Dr. Ramsay is to be heartily congratulated on this fresh addition to our knowledge and to his own laurels.

Argon.—Argon, the name given to the new constituent of the atmosphere, is derived from two Greek words signifying no work. According to Professor Ira Remsen, of Baltimore, the strongest argument against it being an allotropic form of nitrogen is the established fact that the gas conducts itself as if made up of individual particles, while any allotropic form of nitrogen must, according to all we know of such matters, consist of more complex molecules than the nitrogen itself. Professor Crookes has studied the spectra of argon, and Professor Olszewski has succeeded in both liquefying and solidifying it. (*Science*, March 22, 1895.) Berthelot has succeeded in inducing argon to enter into combination with benzene. It is suggested that nitrogenous metabolism of plants may be much dependent on it.—*British Medical Journal*, March 23, 1895.

FORENSIC MEDICINE.

IN CHARGE OF LORENZO D. BULETTE,
Of the Philadelphia Bar.

MEASURE OF THE VALUE OF MEDICAL SERVICES.

THE value of medical and surgical services as measured by legal standards depends upon a variety of circumstances: the character of the disease with which the patient is afflicted; the circumstances of expense, difficulty and responsibility under which the services were rendered; the degree of care and skill required in the treatment; the professional standing of the physician; and in some cases it has been contended that the financial condition or ability of the patient to pay is an element which the medical or surgical practitioner may, in his discretion, take into account in fixing the amount of the charge for his professional services.

The case of *Lange vs. Karnes*,¹ which was an action by a surgeon to recover the amount of his fee, is of some value on this last point. The operation successfully performed by him on the defendant's son was delicate and unusual, and required great skill; and the surgeon was allowed to show that his professional standing was high as bearing on the value of the services so rendered. The charge was reasonable if the plaintiff and his witnesses are to be credited. "On that subject," says the Supreme Court, to which the case was appealed from an order of the trial court denying defendant's motion for a new trial, "it is true there was some conflict of evidence, but that only imposed upon the jury the duty of greater deliberation and scrutiny. There is not such a preponderance of evidence as would justify us in reversing their finding on that subject."

There was also testimony tending to establish a custom or rule of guidance as to charges of physicians for services rendered, and which makes the amount dependent upon the means of the patient,—his financial ability or condition. "But this," continues the Court, "is a benevolent practice which does not affect the abstract question of value, or impose any legal obligation to adopt it, and cannot be said to be universal on the evidence. Indeed, there does not seem to exist any standard by which, in the application of the rule, the amount to be paid can be ascertained. Each case is under the special disposition of the surgeon or physician attending, and he has to decide as to the reduction to be made on account of the circumstances of his patient; and, therefore, when the amount is in dispute, it follows that it is to be determined by proofs to be given on either side. It must be further observed that, although the sum demanded by the plaintiff seems to

¹ 4 N. Y. S. 14.

be large in contemplation of the defendant's income, nevertheless, it appears that he is the owner of property ; and although it may embarrass him, or subject him to inconvenience, he can pay it,—he has the ability to do so. It may be justly said that the plaintiff's knife saved the life of defendant's son, and by a master performance which united skill, knowledge, and experience, and without which it could not have been done. The exceptions are valueless. The plaintiff had a right to show that his standing in the profession was high. The measure of compensation must be controlled more or less by ability in all professions, and the service rendered by its responsibilities and success."

In another case, where a physician claimed two thousand dollars for services in operating on a cancerous stricture of the œsophagus, and it appeared at the trial that the patient's estate was valued at between seven and eight thousand dollars, the jury returned a verdict of five hundred dollars in favor of the physician ; but this sum the Supreme Court of Louisiana, on appeal thereto, increased to one thousand dollars.

BOOK REVIEWS.

TEXT-BOOK OF HYGIENE: A COMPREHENSIVE TREATISE ON THE PRINCIPLES AND PRACTICE OF PREVENTIVE MEDICINE FROM AN AMERICAN STAND-POINT. By George H. Rohé, M.D., Professor of Therapeutics, Hygiene, and Mental Diseases in the College of Physicians and Surgeons, Baltimore. Third Edition, Thoroughly Revised and Largely Rewritten, with Many Illustrations and Valuable Tables. Philadelphia: The F. A. Davis Company, Publishers. London: F. J. Rebman, 1894.

The second edition of this valuable work appeared in 1890, the present edition having been revised and practically rewritten. Rohé's Text-Book is valuable as a record of statistical hygiene, great labor having been spent in arranging tables and in graphic presentation of statistical data. Many of the statements which the book contains are drawn from collected statistics, and are, therefore, valuable to the student of statistics rather than to the student of hygiene. Modern hygiene is so closely interwoven with bacteriology that statistical information is of less practical value than bacteriologic knowledge.

The first chapter is devoted to a study of air, and grouped under this is much of climate; thirty-eight pages are devoted to general considerations, composition, and physical conditions of the atmosphere, influence of the changes of atmospheric pressure on health, and similar study of atmosphere, humidity and air-currents, and the influence of season upon the mortality ; about five pages are devoted to the test for impurity in the air, and six pages to ventilation, which is not studied in connection with heating. The question of water filtration and the purification of water occupies about two pages of the next chapter on water. This chapter is incomplete and unsatisfactory, although the consideration of water-borne diseases is fairly comprehensive. The article on food does not include meat-inspection, and there is little to aid the inspector in arriving at any conclusion as to the quality of meat. The author is not inclined to believe that the meat of tuberculous animals in the earlier stages

of the disease is likely to be injurious. The resolution of the International Sanitary Congress of 1893, which permits of the flesh of tuberculous animals where the disease is only commencing being used for food, is commended, while the resolutions of the Congress for the Study of Tuberculosis (1888) are merely referred to. Microscopic examination of meat for trichinæ, where such parasites are suspected, is commended; routine microscopic examination of pork, the only way of detecting trichinæ, is not advised. Seven pages are devoted to the consideration of meat as a food and meat-diseases, and a like number of pages is devoted to beverages containing alcohol. The chapter, taken as a whole, is satisfactory, and has many points of superiority which contrast markedly with the faulty consideration of meat-inspection and the recognition of meat-diseases.

The chapter on soil, particularly that portion relating to soil air, is good; bacteriologic statements made in connection with the soil are singularly incorrect. The statement that bacteria may be "transported to a distance" by ground-air currents can scarcely be received in our knowledge of bacteriology. The statement that non-putrefactive decomposition is due to the *bacterium lineola* and that the *bacterium termo* is the particular organism of putrefaction evinces a superficial knowledge of bacteriology. The article on removal of sewage is practical and is to be recommended; the author having shown his rich judgment in selecting and commending the best appliances and systems. The chapter on habitations is satisfactory, except the consideration of heating; three pages are devoted to lighting, and one-half page to the consideration of heating; that portion which relates to plumbing and water-closets is very good. The chapter on the construction of hospitals is practically a consideration of the advantages adopted in the Johns Hopkins Hospital, and cannot, therefore, be aught else but good; it is deficient in that it does not describe the heating system of the Johns Hopkins Hospital.

The chapter on schools is a valuable one, although the statement that "natural ventilation would give better satisfaction than a complicated artificial system" will not be generally accepted. The article on Industrial Hygiene is valuable, as is also the chapter on Military Hygiene. The articles on Marine and Prison Hygiene, although the latter is very brief, are satisfactory. A little over three pages are devoted to clothing; four pages are devoted to the germ theory of disease. From an historical point of view, the chapter on Epidemic Diseases evinces the rich store of learning which the distinguished author possesses; there is manifested, however, a disposition not to accept the modern bacteriologic factor in the production of many diseases whose etiology seems fairly well worked out; thus, the statement is made in regard to cholera that "the poison may be either an organic germ, or of an inorganic, particulate, or gaseous nature." The author is of the opinion that typhoid fever can be disseminated by sewer-air. The author does not believe that quarantine can be of any avail in the suppression of influenza. The chapter on Antiseptics and Disinfection is to be commended. The chapter on Vital Statistics is short but replete with valuable data and commendable methods for compiling statistical information. The author wisely calls attention to the danger of accepting many of the available statistics. The chapter on the examination of air, water, and food is good, although the author has neglected to consider what seems to deserve general adoption, Leffmann's methods in milk analysis. The chapter on quarantine is admirable, and the introduction of quarantine laws increases the value of the chapter.

The chapter on quarantine is from the pens of Surgeon-General Walter Wyman and Dr. Geddings, of the United States Marine Hospital Service; Marine Hygiene is from the pen of Medical Director Albert L. Gihon, of the United States Navy; the section on Vital Statistics and methods of examination of air, water, and food, are from Professor Seneca Egbert.

In conclusion, it may be said that for statistical data, this represents the ablest compilation published in this country, and that the book is to be commended.

RELATIONS OF DISEASES OF THE EYE TO GENERAL DISEASES. By Max Knies, M.D., Professor Extraordinary at the University of Freiburg. Edited by Henry D. Noyes, A.M., M.D., Professor of Ophthalmology and Otology in Bellevue Medical College; Executive Surgeon to the New York Eye and Ear Infirmary, etc. Octavo, pp. x, 467. New York: William Wood & Company, 1895.

The subtitle, "Forming a Supplementary Volume to every Manual and Text-Book of Practical Medicine and Ophthalmology," tells the purpose of this work.

At this time, when it is considered that specialism is so rife among beginners in medicine that they often without any prolonged or proper practical training in general medicine immediately search for and obtain a fairly adequate idea of the abnormal conditions of some special organ of the body; and when it is realized that many who are more advanced in some chosen line of work seem to imagine that every ill that flesh is heir to bears some more or less relationship to the poor organ that is under their especial charge; it can be seen that some such work as this, which not only acts as a friend to teach them the relationship that any one organ bears to the whole organism, but serves as a guide to help them out of the rut of narrowness into broader and more comprehensive views of the etiology and symptomatology of both local and general disease, is extremely valuable and useful.

Moreover, as a companion for the general practitioner who wishes to have a sequentially arranged compilation and a systematic grouping of all related organic symptoms of gross general disease brought together for ready and easy reference into one volume, the present undertaking serves a most worthy purpose. In other words, the work is practically a high grade and carefully-prepared Medical Ophthalmology.

After a few preliminary remarks and a table of contents, the reader is immediately ushered into the most important and at present one of the most certain of the relationships,—that of the ocular symptoms in nervous diseases. After being well grounded in the newer views of the anatomy of the parts, he is carried quickly and well over the entire subject. Diseases of the skin and digestive organs are next briefly but succinctly taken up. This is rapidly followed by the respiratory, the circulatory, the urinary, and the sexual organs; each division receiving a careful *résumé* of the knowledge that we now possess upon the subject treated.

The next chapter, "Poisons and Infectious Diseases," the latter part of which is by far the best in the book, can be read with profit by any one who desires to keep abreast with the rapid advances that medicine is making in this type of cases.

A chapter upon "Constitutional Disease" closes the work. In this, there is an exceedingly interesting and valuable section upon "Tumor Cachexia" which, although extremely brief, will repay any one to peruse.

The subject-matter is well handled, the references are easy to find, and the literature upon each topic is given directly in the text, thus rendering the work one that can be readily employed to advantage by those who have but little time to spare when in search of more extended data. The reviewer has several times, during the brief time that he has had the volume in his possession, found it to be of the greatest service in such research.

We can most heartily recommend this, the English edition of the work by Dr. Noyes, to all of our readers who are in any way interested in the subject as a careful and a faithful translation of the original, which has given its author such a well-merited reputation in his own and other countries of Europe.

C. A. O.

THE DISORDERS OF SPEECH. By John Wyllie, M.D., F.R.C.P. (Ed.), Physician to the Royal Infirmary, etc., Edinburgh. Olwei & Boyd. Pp. 495. 18 shillings, cloth.

If it were possible for us to do justice to this splendid work short of writing an elaborate review of it we should esteem ourself fortunate, because our space is limited while our admiration for the book as a literary achievement is unbounded. We

are convinced, however, that it is not possible for us to condense an adequate expression of our judgment of this important treatise in our short space, and we shall not attempt to do so. The monograph is so full, so complete, and withal so clearly written that it deserves a much better fate than merely to meet with hurriedly-written book-notices; and we have no doubt that it will meet with a better at the hands of all thoughtful students, to whom we highly recommend it.

It is not amiss, however, to call the reader's attention to the fact that here we have the most thorough, most learned, and most scientific work on the disorders of speech to be found in the English language. The text of the work, as will doubtless be recalled, was originally published as a series of articles in the *Edinburgh Medical Journal* between October, 1891, and May, 1894. These are now gathered together by the author, and issued by the publishers in a handsome volume in every way worthy of such a meritorious treatise.

As an exhibit of the scope of the work we may enumerate some of the subjects treated by the author. These are stammering, whispering, hysterical aphonia and mutism, paralysis of the adductors and abductors, the occupation-neurosis of professional voice-users (with an instructive digression in favor of writers' cramp); the congenital and developmental defects of speech in idiots and imbeciles; dumbness, paralysis of the mouth, and oral deformities; bradylalia and logorrhœa; deaf-mutism. To the sections containing the discussion of the above and allied topics is added a chapter on the development of speech in the human race, the origin of written language, and the invention of printing.

The most important part of the work is devoted to a study of speech in its relations to diseases of the nervous system. Aphasia in all its varieties and all its relations is discussed with a lucidity which few writers have attained in dealing with this complex subject. The history of the subject is always given in sufficient detail, and the clinical aspects of the sensory and motor aphasias, and their various subforms, are given in a most intelligible way. Perhaps Dr. Wyllie inclines a little too much to a complex differentiation of the subject,—a weakness which all exhibit soon or late who venture into this variegated and fertile field. Against this tendency we think that Pitre's recent paper acts as a wholesome corrective, but we must give Dr. Wyllie credit for not erring in this way with the frightful prolixity and Hellenistic *logorrhœa* that characterize some others. We believe that some of this confusion arises in some writers from not recognizing one fundamental fact,—i.e., that the first temporal convolution is the *primary* centre for speech; that it is in this centre that language is originally acquired (by *hearing* it spoken), and consequently that it is the centre in which the *object* and its *word* are first intimately associated. It is the breaking up of this association, by loosening the connecting fibres that run from the auditory to the visual as well as to the motor speech centre, that causes not a few of the apparently anomalous subdivisions of aphasia, as *paraphasia*, and some forms erroneously called verbal *amnesia*. To understand this it must be recalled that a child in learning the meaning of a spoken word is apt to use the sight conjointly with the hearing,—thus, when it learns the meaning of the word "apple" it uses its sight for the object even before it learns to utter the word. The same may be said for the tactile sense as a support or contribution to the primary speech centre. Another, but allied, important fact is fully brought out by Dr. Wyllie; it is the one upon which Chareot insisted,—i.e., that persons differ widely in their reliance upon the various centres in their use of a language: some may rely more upon visual images, some more upon auditory, and some more upon even graphomotor. Hence arise variations.

Dr. Wyllie's book is pre-eminently for the specialist, but it is also for all or every one whose scientific curiosity is sufficiently active to lead him to pursue inquiries in this most interesting field of one class of disorders of the human cortex.

J. H. L.

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ORIGINAL COMMUNICATIONS.

THE TREATMENT OF EMPYEMATA IN CHILDREN, BASED ON AN ANALYSIS OF EIGHTY-SIX CASES.

BY EDMUND CANTLEY, M.D., ETC.,

Physician to the Belgrave Hospital for Children.

It may, perhaps, seem out of place for a physician to write a paper on methods of treatment which are almost always essentially surgical. I do so for two reasons. In the first place, the patient requiring treatment comes primarily under the care of a physician, who makes the diagnosis, and, if he deems it necessary, calls in a surgeon to perform the requisite operation. Usually the physician, often a man of little surgical knowledge and not abreast of the advances in surgery, decides upon the nature of the operation. In the second place, although the different modes of treatment have been before the profession for years, Celsus, I believe, having been the first man known to have performed rib-resection, there is no universal consensus of opinion as to which is the safest and the best. Dogmatic opinions are freely expressed on one side or the other, more commonly from the lips of physicians than of surgeons, and supported by a varying amount of clinical experience and recorded cases.

Thus, Solis-Cohen, author of the article on the "Surgery of the Air-Passages and Lungs" in Ashhurst's "International Encyclopædia of Surgery," states, when writing of pleural effusion, that "*the absorption of pus is in practice a myth.*" Treatment by aspiration is praised or abused in terms almost as strong. The late Dr. Sturges,¹ in a letter to the *Lancet* in 1894, stated that at one time he held that if a free vent for pus could be

¹ *Lancet*, 1894, i. 1215, "Empyema in Childhood," Octavius Sturges.

secured and maintained, the removal of rib is unnecessary; he had, however, altered his views and believed that in almost all cases it is necessary, and that the small mortality from empyema in childhood, whether single or double, is due to improved treatment in that respect. Batten,¹ in support of this statement, records a series of cases treated at the Hospital for Sick Children, Great Ormond Street. Sutherland² goes even a step further, and writes that "the usual operative treatment is to open the abscess after resection of a rib, to explore the cavity with the finger, and, *after washing it out*, to insert a drainage-tube. This may be taken as representing the accepted surgical procedure of the present day."

On the other hand, Wardrop Griffith³ and Wightman,⁴ from statistics of cases treated in hospital, and Morrison,⁵ from statistics of cases treated in private practice, maintain that as a general rule resection of rib is unnecessary, and that almost all cases of empyema in children can be cured by simple incision and drainage.

The following series consists chiefly of records of patients, under twelve years of age, treated for empyema in St. Bartholomew's Hospital during the years 1883 to 1893. I am deeply indebted to the kindness of the physicians, under whose care the patients were, for permission to make use of the notes. Dr. Ewart has also kindly allowed me to make use of the notes of a few cases which have been under his care at the Belgrave Hospital for Children. A few of the patients have been under my own treatment at the latter hospital.

I propose to place before you an analysis of these cases, with special reference to the treatment, and to compare it with the analysis of the results obtained and recorded by other observers.

¹ Lancet, 1894, i. 1368, "Empyema in Childhood," F. E. Batten.

² Lancet, 1894, i. 198, "The Treatment of Empyema," G. A. Sutherland.

³ Medical Chronicle, ix. 441, "Fifty Consecutive Cases of Empyema," T. Wardrop Griffith.

⁴ Lancet, 1894, i. 1128, "The Treatment of Empyema in Children," T. P. Wightman.

⁵ Lancet, 1894, ii. 738, Northumberland and Durham Medical Journal, April, 1893, A. E. Morrison.

CASES IN WHICH NO OPERATION WAS PERFORMED.

No.	Sex.	Age.	Side Affected.	Cause Assigned.	Mode of Treatment.	Nature and Amount of Fluid.	Result.	Duration of Treatment after Operation.	Remarks.
1	M.	2 $\frac{3}{4}$	Right.	Sequel of measles and bronchitis. 8 weeks' illness.	Exploration twice. Interval of 1 month.	Pus found each time.	Cure.	17 days after second exploration.	Child gained weight. Contracted side and droop of shoulder left. Subnormal temperature for twenty days before discharge. Note, impaired at base.
2	M.	1 $\frac{3}{8}$	Left.	Measles.	Exploration.	Nil.	Death.	Admission 1 month.	The probable cause was an injury to the rib due to a fall five weeks before admission. Secondary pyæmia. Hectic temperature all the time. <i>Post mortem</i> .—Caries of right seventh rib and of head of right humerus, connected with abscesses, which were opened during life. Fetid abscesses in right iliacus muscle. Consolidation of left lung and five or six ounces of pus in the pleural cavity.
3	M.	6	Left.	Indefinite history of illness for a year. Fall 6 weeks ago.	Incision into a superficial abscess, about level of sixth rib, in anterior axillary line.	Small amount of shreddy pus.	Cure.	23 days after the last pus was coughed up.	Small amount of pus coughed up; five and one-half ounces in seven days. No connection found between the abscess and pleura. Empyema discharging through the lung. Subsequent contraction of the side.
4	M.	8	Right.	Exposure to cold 2 months before.	Exploration twice, on successive days.	Pus each time.	Cure.	32 days after coughing up $\frac{1}{2}$ ounce of pus.	Empyema discharging partially through lung; partially reabsorbed. Gradual recovery with much deformity.

CASES TREATED BY ASPIRATION.

No.	Sex.	Age.	Side Affected.	Cause Assigned.	Mode of Treatment.	Nature and Amount of Fluid.	Result.	Duration of Treatment after Operation.	Remarks.
5	M.	1 $\frac{7}{12}$	Right.	Gradual onset, 1 month.	Aspiration.	Pus, 3 $\frac{1}{2}$ ounces.	Cure.	42 days.	The fluid re-collected and was then absorbed. Partial falling in of the side.
6	M.	1 $\frac{3}{4}$	Left.	Gradual onset, 5 weeks.	Aspiration. Exploration in 3 weeks.	Chocolate-colored, purulent fluid, 27 ounces. Thick, curdy pus.	Cure.	12 weeks after exploration.	The fluid re-collected after the aspiration, and was then slowly absorbed. Marked flattening of the chest resulted.
7	M.	2 $\frac{7}{12}$	Right.	Measles 1 month ago.	Admitted, Nov. 7. Aspiration, Nov. 16. Aspiration, Nov. 25. Aspiration, Nov. 30.	. . . . . Pus, 2 drachms. Pus, 1 $\frac{1}{2}$ ounces. Pus, $\frac{1}{2}$ drachm.	Cure.	20 days after the last aspiration.	No record as to condition of chest when discharged.
8	F.	4	Right.	Measles 1 month ago. Pneumonia.	Exploration, Dec. 6. Exploration, Jan. 17. Aspiration, Jan. 19. Aspiration, Jan. 30.	Nil. Pus. 6 ounces. 3 ounces.	Cure.	22 days after the last aspiration.	No re-collection after the second aspiration. Had pneumonia on admission. Effusion small and localized in the axilla.
9	M.	4	Left.	Sequel of whooping-cough. Pneumonia a month ago?	3 weeks after admission, aspiration.	Pus, 5 $\frac{1}{2}$ ounces.	Cure.	39 days.	No re-collection; gradually cleared up.
10	M.	4 $\frac{3}{4}$	Left.	Gradual onset, 9 weeks.	Aspiration, Aug. 18. Aspiration, Sept. 1.	Thick pus, 18 ounces. 5 ounces.	Cure.	42 days after the second aspiration.	Positive pressure in the pleura before the first tapping. Much subsequent contraction of the side.
11	M.	4	Left.	Admitted on May 12th with pneumonia.	Exploration, June 11. Aspiration, June 26.	Pus, a few drops. 2 to 3 drachms.	Cure.	14 days.	Temperature hectic before tapping; came down on tapping, and remained down. No subsequent re-collection.

12	F.	5	Left.	Admitted on 4th day. Pneumonia.	Exploration, Aug. 19. Aspiration, Aug. 19. Aspiration, Aug. 23. Aspiration, Oct. 2.	Pus. <i>Nil.</i> 2½ ounces. Pus.	Cure.	34 days after the last aspiration.	Hectic temperature from September 5 to September 16, and again from October 7 to October 16. The empyema pointed on October 12, near the angle of the scapula, and ruptured on October 16. The sinus closed on the twelfth day.
13	M.	5	Right.	6 weeks gradual onset.	Aspiration. Irrigation with water. ½ ounce of tr. iodi injected.	Pus, 3 ounces.	Cure.	28 days.	The temperature rose to one hundred and two degrees on the morning after the injection, but came down that night, and did not go up again. Uniform progress. Still dulness when discharged.
14	M.	6½	Right.	Ailing 2 months. Pneumonia at onset (?)	Aspiration.	Pus, 2 ounces.	Cure.	39 days.	Gradually cleared up, but dull at the base, even when discharged. Good air entry.
15	M.	7	Left.	Admitted on 4th day of apical pneumonia.	Exploration. Aspiration.	Pus. 2 drachms.	Cure.	55 days.	Slow recovery. Discharged with a contracted side and deficient air entry at the base.
16	F.	11	Right.	5 weeks' illness. Probably pneumonia at first.	Exploration, Nov. 28. Aspiration, Nov. 29	Pus. 1½ ounces.	Cure.	12 weeks.	Partial re-collection, and subsequent absorption. Perhaps some of the pus was expectorated. Considerable deformity.

CASES TREATED BY INCISION AND DRAINAGE.

No.	Sex.	Age.	Side Affected.	Cause Assigned.	Mode of Treatment.	Nature and Amount of Fluid.	Result.	Tube Removed.	Wound Healed.	Duration of Treatment after Operation.	Remarks.
17	F.	1	Right.	Broncho-pneumonia.	Exploration. Incision made in mid-axillary line, 6th space, 3 weeks after admission.	Pus. Pus, 6 ounces.	Cure.	16th day.	18th day.	40 days.	Uninterrupted recovery.
18	M.	1 $\frac{3}{4}$	Left.	Gradual onset, 3 weeks.	Exploration, Jan. 24. Exploration, Feb. 1. Incision in 7th space, posterior axillary line.	Nil. Pus. 3 ounces of sweet pus.	Death.	. . . .	. . . . .	12 days.	Died of general bronchitis, with broncho-pneumonia of left lung. The discharge remained sweet. No post-mortem.
19	F.	1 $\frac{1}{2}$	Right.	Whooping-cough and bronchitis. Ill 3 months.	Exploration, June 13. Incision, Aug. 5.	Pus.	Cure.	. . . .	. . . . .	46 days.	No record as to the removal of the tube or healing of the wound.
20	F.	1 $\frac{1}{2}$	Left.	Gradual onset, 3 months.	6th space in anterior axillary line.	10 ounces of thick, sweet pus.	Cure.	14th day.	17th day.	22 days.	Positive pressure at the time of operation. The lung immediately re-expanded. The tube might have been removed earlier; it was four inches long at first.
21	F.	2 $\frac{1}{2}$	Right.	Ill 3 weeks.	Aspiration, July 13. Incision in 6th space, mid-axillary line, on July 18.	Pus, 8 ounces. Pus, 6 ounces.	Cure.	34th day.	37th day.	7 weeks.	The tube might have been removed much earlier. Discharge noted as scanty and serous on August 11.
22	F.	2 $\frac{1}{2}$	Right.	Admitted with right apical pneumonia.	Incision 19 days after. Irrigation at the time of operation, and daily after it, with solution of boro-glyceride.	Pus, 12 ounces.	Death.	. . . .	. . . . .	16 days.	A week after the operation, between one and two ounces of fetid pus was discharged. Temperature did not come down after the operation, and remained hectic to the end. No post-mortem examination.

23	M.	2½	Left.	No definite history.	Opening and counter-opening. Tube passed through.	1½ pints of thick, creamy pus.	Cure.	. . . .	4 months.	4½ months.	Pointing at the time of admission. The wound might probably have been allowed to close much earlier. One month after the operation it was noted that there was very little discharge. Considerable contraction of the side.
24	F.	2¾	Left.	Gradual onset, 1 month.	Exploration, Mar. 20. Aspiration. Incision, posteriorly, April 3.	Pus, 20 ounces. Pus, 18 ounces.	Cure.	24th day.	12 weeks.	13 weeks.	The fluid re-collected rapidly after aspiration, and there was positive pressure at the time of the incision. Five days after, the discharge was scanty and serous.
25	F.	3	Left.	. . . . .	Incision and irrigation.	Not much pus.	Cure.	. . . .	. . . .	5 weeks.	Temperature was markedly hectic after the operation, and even when discharged. Probable phthisis.
26	F.	3	Right.	Admitted on 6th day of right apical pneumonia.	Exploration, May 6. Aspiration, May 6. Aspiration, May 16. Aspiration, May 29. Incision, June 6.	Pus, 1½ ounces. Nil. Pus, 4½ ounces. Pus, 3 ounces.	Cure.	37th day.	. . . .	6 weeks.	Much albumin in the urine noted at the time of the pneumonia.
27	M.	3¼	Left.	Gradual onset, 1 month.	Exploration, June 27. Incision, June 27.	Nearly 1 pint of thick pus.	Cure.	In 24 days or less.	38th day.	7 weeks.	It was noted on the fourth day after operation that the discharge was very scanty.
28	F.	3½	Left.	Ailing 2 years. Bulging of chest noticed for 3 months.	Aspiration, Aug. 2. Incision, Aug. 9.	Pus, 13 ounces. Pus, 12 ounces.	Cure.	. . . .	5½ months.	5½ months.	On August 9 the empyema pointed below the nipple. Ribs too close for a drainage-tube. Two days later a stiff rubber catheter was put in, and a few days after a silver tracheotomy-tube was inserted and the cavity irrigated; the pus had become fetid. Temperature normal after October 7.

No.	Sex.	Age.	Side Affected.	Cause Assigned.	Mode of Treatment.	Nature and Amount of Fluid.	Result.	Tube Removed.	Wound Healed.	Duration of Treatment after Operation.	Remarks.
29	F.	3½	Left.	Ailing 11 weeks.	Exploration, April 22. Aspiration, April 22. Incision, June 13. Counter-opening, July 8.	Pus. Pus, amount (?) Pus, 9 ounces.	Death.	. . . .	. . . .	33 days.	The empyema pointed in the mid-axillary line before being opened. The first aspiration was before admission. Whooping-cough developed the day after admission. Hectic temperature after May 6. <i>Post mortem</i> .—General tuberculosis. A little pus in left pleural cavity. Partial collapse of lung.
30	M.	3½	Right.	Acute onset 5 weeks ago. Admitted on Oct. 13.	Aspiration and incision, Oct. 19.	Pus, 8 ounces.	Cure.	7th day.	60 days.	63 days.	The tube had to be reinserted on the forty-fifth day on account of a small local collection. Much broncho-pneumonia. Much contraction of the side.
31	M.	4	Right.	Acute empyema or pneumonia, for which admitted.	Exploration, Sept. 1. Aspiration, Sept. 6. Aspiration, Sept. 8. Incision, Sept. 13.	Sero-pus. Pus, 9½ ounces. Pus, 5 ounces. Pus, 4 ounces.	Cure.	9th week.	In a few days more.	10 weeks.	Tube in nine weeks, although frequently it was noted that there was no discharge. An attack of acute nephritis from October 2d onward. No albuminuria when discharged.
32	M.	4	Left.	Fall on head 3 weeks ago.	Exploration, June 29. Incision, June 29.	. . . . . Pus, ½ pint.	Cure.	4th week.	. . . .	7 weeks.	. . . . .
33	F.	4	Left.	Fall on head 7 weeks ago.	Aspiration and irrigation with Condy's fluid, Aug. 23. Aspiration and irrigation with carbolic, Sept. 1. Incision, Sept. 13. Irrigation with weak carbolic on Sept. 14.	Pus, 7 ounces. Pus, 9 ounces. Pus, 10 ounces.	Death.	. . . .	. . . .	32 days.	Temperature remained down for five days after the operation, and then went up suddenly. Cause of death, erysipelas. No post-mortem.

34	F.	4	Left.	Whooping-cough and bronchitis, 2 months ago.	Aspiration, July 26. Aspiration, Aug. 9. Incision, Sept. 30.	Thick pus, 26 ounces. Thick pus, 9 ounces. Amount (?)	Death.	. . . . .	. . . . .	35 days.	The operation was performed under Listerian precautions. Two weeks later the discharge was offensive. Two weeks later it was irrigated with one in eighty carbolic lotion. On the fourth day of the irrigation, immediately after the injection of the first syringeful, the patient died of syncope. <i>Post mortem</i> .—Left lung airless, but not diseased; bound down by greatly thickened pleura. Cavity contained two ounces of thick pus. Bronchial glands caseous. Foramen ovale open.
35	M.	4	Right.	Sequel of measles and bronchitis, 2 months ago.	Incision.	Sweet pus, 18 ounces.	Death.	. . . . .	. . . . .	5 days.	<i>Post mortem</i> .—Localized empyema. Broncho-pneumonia of right upper lobe, and collapse of lower lobe. Purulent meningitis of brain and spinal cord.
36	M.	4½	Right.	Indefinite. Ailing 3 weeks.	Aspiration, April 26. Aspiration, May 9. Aspiration, May 17. Incision, May 25.	Sweet pus, 3½ ounces. Sweet pus, 17 ounces. Rather fetid pus, 6 ounces. Slight smell.	Cure.	41st day.	?	11 weeks.	Tube reintroduced the day after it was removed, and the cavity irrigated. Still slight discharge at end of eight weeks. A counter-opening was made at the same time as the first incision.
37	M.	4½	Left.	Measles, 2 weeks ago.	Aspiration, May 27. Aspiration, May 29. Incision, June 4. Reopened, June 16.	Pus, 4½ ounces. Pus, 10 ounces. Pus, 14 ounces. Pus, 3 ounces.	Cure.	7th day. 20th day.	22 days after second operation.	7 weeks.	The tube was removed too soon, and there was a small reaccumulation.
38	F.	5	Left.	Pneumonia, 5 weeks ago.	Aspiration, April 17. Incision, May 18.	Pus, 10 ounces. Pus, 8 ounces.	Cure.	At least 6 weeks (?)	?	7 weeks.	The empyema pointed at the seat of the aspiration puncture before it was opened.

No.	Sex.	Age.	Side Affected.	Cause Assigned.	Mode of Treatment.	Nature and Amount of Fluid.	Result.	Tube Removed.	Wound Healed.	Duration of Treatment after Operation.	Remarks.
39	M.	5	Left.	May 29, admitted for left apical pneumonia.	Exploration, June 17. Aspiration, June 19. Incision, June 27.	Pus. Pus, 4 ounces Pus, 12 ounces.	Cure.	?	?	4 months.	Noted on July 1st, and again on October 3d, that there was very little discharge.
40	F.	6	Right.	Ailing 2 weeks.	Exploration, May 28. Exploration, June 2. Incision, June 2.	Nil. Thick, creamy pus. Pus, $\frac{1}{2}$ ounce.	Cure.	32d day.	44th day.	9 weeks.	Operation done under Listerian precautions. Wound only dressed four times. Tube pushed out by granulations.
41	M.	6	Left.	"Inflammation of lungs," 2 months ago.	Incision, Oct. 21. Counter-opening, Nov. 12.	Pus, 26 ounces.	Cure.	?	?	6 weeks.	Pointing in fifth space, mid-axillary line. Contraction of chest.
42	M.	6	Right.	Gradual onset, 8 weeks.	Incision, June 18.	Pus, 15 ounces.	Cure.	51st day.	55th day.	58 days.	The empyema discharged partially through the lung on the night of admission. Temperature was irregular for a month after the operation.
43	M.	6 $\frac{1}{2}$	Left.	Admitted with pneumonia.	Incision.	Pus, 6 ounces.	Cure.	42d day.	44th day.	50 days.	The empyema was localized at the apex, and the incision was made in the second interspace.
44	F.	7	Right.	Gradual onset, 3 months.	Exploration, May 24. Opening and counter-opening, May 29.	Thick pus. Several ounces.	Cure.	22d day.	30th day.	38 days.	The tube was removed from the upper opening on the sixth day. Good re-expansion of the lung.
45	M.	7	Right.	Admitted with pneumonia, on Aug. 4.	Exploration, Aug. 23. Aspiration, Aug. 30. Incision, Sept. 12.	Pus. Pus, 1 ounce. Pus, 7 ounces.	Cure.	?	?	24 days.	Temperature fell after the aspiration. Empyema pointed before being opened; it was a localized one.

46	F.	7½	Left.	Measles, 2 months ago.	Incision, July 31. Reopened and counter-opening made Dec. 29.	Pus, 38 ounces.	Cure imperfect.	Tube in 37 days. 44 days (?)	In another 3 days (?)	3½ months. 2 months.	Pointing above left mamma on admission. Discharged cured, to a convalescent home. Returned in a month; small re-collection; eventually sent out with a sinus still left.
47	F.	8	Left.	Pneumonia, for which admitted.	Admitted, June 12. Aspiration, June 22. Incision, June 27.	. . . . . Pus, 7 ounces. Pus, 10 ounces.	Cure.	15th day.	18th day.	21 days.	Dressed every third day. Discharge quite thin, and almost ceased in two days.
48	F.	9	Right.	Pneumonia, for which admitted, on Aug. 5.	Aspiration, Aug. 18. Aspiration, Aug. 25. Incision, Sept. 4.	Pus, 8 ounces. Pus, 1½ ounces.	Cure.	27th day.	29th day.	40 days.	September 7, discharge scanty and thin. September 18, discharge tenacious and purulent.
49	M.	10	Left.	3 weeks ago, pleurisy (?)	Aspiration, Jan. 17. Exploration, Mar. 21. Exploration, April 21. Incision, April 21.	Serum, 10 ounces. Nil. Pus. Pus, 12 ounces.	Cure.	32d day.	?	8 weeks.	Side contracted before the operation. Sinus when discharged. Readmitted and thoracoplasty performed; sinus then healed.
50	F.	11	Left.	Ill 5 weeks, broncho-pneumonia.	Opening and counter-opening. Tube passed through.	Pus, 1½ pints.	Cure.	3d day. 15th day.	54 days.	58 days.	Positive pressure at the time of operation. The tube had to be inserted again on account of re-accumulation of pus, and remained in another three weeks. Wound healed three days after it was removed.
51	F.	11	Left.	Pneumonia, 5 weeks ago.	Exploration, July 23. Exploration, July 26. Incision, July 26.	Serum. Pus. Pus, 8 ounces.	Death.	. . . . .	. . . . .	10 days.	Between three and five days after the operation she had eight fits. On the fifth day pericarditis was diagnosed, and she was unconscious. Died of exhaustion. Temperature one hundred and five degrees before death. <i>Post mortem.</i> —A fairly extensive, localized empyema shut off by adhesions on all sides. Lung airless, traversed by numerous fibrous bands. Recent pericarditis; not purulent. Nephritis.

CASES TREATED BY RESECTION AND DRAINAGE.

No.	Sex.	Age.	Side Affected.	Cause Assigned.	Mode of Treatment.	Nature and Amount of Fluid.	Result.	Tube Removed.	Wound Healed.	Duration of Treatment after Operation.	Remarks.
52	M.	1	Right.	5 weeks ago, measles and broncho-pneumonia.	Admitted, July 10. Exploration, July 21. Resection, July 22.	. . . . . Pus. Pus, 7 ounces, not quite sweet.	Cure.	20th day.	29th day.	9 weeks.	The discharge was serous on the sixth day after the operation. Much trouble from diarrhoea.
53	M.	1	Right.	Measles.	Exploration. Resection.	Greenish-brown fluid, containing pus. About 5 ounces.	Death.	. . . . .	. . . . .	3 days.	Child had perforating ulcer of right eye, ulceration of left cornea; ulcer on scalp; sore on right index finger. <i>Post mortem.</i> —Both lungs covered with thick lymph, and adherent throughout, except for the cavity on the right side. Purulent mediastinitis.
54	F.	1½	Right.	General bronchitis.	Exploration, Aug. 20. Resection, Aug. 21. Irrigation with weak iodine solution for 5 days from Sept. 1.	Pus. Very little pus. Discharge, had a sour smell.	Death.	. . . . .	. . . . .	31 days.	Temperature came down after the irrigation, but went up again on September 17, and she developed a squint. Died on the 20th. Irrigation induced cough and vomiting. <i>Post mortem.</i> —Much creamy pus in the cavity. Lung airless and coated with thick lymph. A small hole in the lung opposite the incision, opening into a smooth-walled cavity, one inch by one-quarter inch. Right lung normal.
55	F.	1½	Right.	Acute onset, 12 days ago.	Exploration, May 24. Resection, May 25.	Pus. Pus, 8 ounces.	Death.	. . . . .	. . . . .	4 days.	Temperature rose steadily on the third day. <i>Post mortem.</i> —(Edema of left and upper lobe of right lung. Consolidation of right middle and

lower lobes with numerous anæmic, homogeneous patches; probably necrotic. Fair-sized cavity lined with lymph and containing a little sero-pus.

56	F.	1 $\frac{1}{2}$	Left.	9 weeks, gradual onset.	Aspiration, Nov. 21. Resection, Nov. 23.	3 drachms of thick, curdy pus. Pus, 1 $\frac{1}{2}$ ounces.	Death.	. . . . .	2 days.	No rise of temperature. <i>Post mortem.</i> —Acute pericarditis. Slight lobular pneumonia of right lung and left upper lobe. A little soft lymph in the pleural cavity.
57	F.	2	Right.	May 25, pneumonia, for which admitted.	Exploration, June 13. Resection, June 14. Iodine baths, July 20.	Pus. Pus, 8 ounces.	Death.	. . . . .	39 days.	The temperature remained somewhat hectic; came down to normal for seventeen days before death; rose the day before. Diarrhœa on the day of death. <i>Post mortem.</i> —Right lung adherent, much collapsed, and carnified. No pus in cavity. Left lung,—bronchitis, partial collapse of base.
58	M.	2	Left.	2 months, gradual onset.	Exploration, Aug. 21. Resection, Aug. 26.	Pus. Pus, 4 ounces.	Cure.	89th day.	97 days.	Not much discharge on the fourth day after operation; subsequently it varied much in character and amount. The tube was exchanged for pewter wire at times.
59	F.	2 $\frac{1}{2}$	Right.	Lung trouble, for 6 weeks. Bronchopneumonia.	Exploration, July 7. Resection, July 8.	Pus. Pus, 3 ounces.	Cure.	18th day.	54 days.	. . . . .
60	M.	2 $\frac{1}{2}$	Right.	Sudden onset, 3 weeks ago.	Aspiration, June 19. Resection, June 19.	Pus, 5 ounces. Pus, 10 ounces.	Cure.	?	31 days.	The tube was one and one-half inches long on the thirteenth day after operation; no further record.
61	M.	2 $\frac{1}{2}$	Right.	Onset, 3 weeks ago.	Resection.	Old blood-clot and 16 ounces of pus.	Cure.	?	44 days.	. . . . .

No.	Sex.	Age.	Side Affected.	Cause Assigned.	Mode of Treatment.	Nature and Amount of Fluid.	Result.	Tube Removed.	Wound Healed.	Duration of Treatment after Operation.	Remarks.
62	M.	2 $\frac{1}{2}$ $\frac{1}{2}$	Left.	Bronchitis, 5 weeks ago.	Exploration. Resection.	Pus, 1 $\frac{1}{2}$ ounces.	Cure.	15th day.	25th day.	27 days.	Probably pneumonia of left lower lobe when admitted.
63	M.	3	Right.	Measles. Pain in side, 3 weeks ago.	Exploration. Resection. Irrigation with carbolic lotion.	Much thick and curdy pus.	Cure.	?	22d day.	26 days.	As much as two inches of rib resected.
64	F.	3 $\frac{1}{2}$	Left.	Pneumonia.	Resection.	Pus, 5 ounces.	Cure.	26th day.	?	?	Complicated by measles beginning four days before the tube was left out.
65	F.	4	Right.	Acute onset, 5 weeks ago.	Aspiration, Aug. 22. Resection, Aug. 26.	Pus, 14 ounces. Pus, 12 ounces.	Cure.	?	31st day.	47 days.	The fluid accumulated very quickly after aspiration.
66	M.	4	Right.	Measles.	Resection.	Pus, 2 ounces.	Cure.	22d day.	26th day.	31 days.	.....
67	F.	4	Left.	Ill 5 weeks.	Exploration. Resection.	Pus, 14 ounces, thick.	Cure.	?	More than 36 days.	43 days.	Operation followed by immediate expansion of the lung.
68	F.	4	Left.	Ill 3 weeks.	Aspiration, June 29. Resection, June 30.	Pus, 5 ounces. Pus, 16 ounces, thick and curdy.	Cure.	?	More than 28 days.	48 days.	Discharge scanty and serous on the ninth day, and almost absent on the twenty-eighth day. Lung expanded well.
69	F.	4	Left.	Sudden onset.	Exploration, June 10. Resection, June 11.	Pus, 9 ounces.	Cure.	34th day.	39th day.	48 days.	The tube was removed on the twenty-second day, but had to be replaced. Temperature came down the day after operation and remained down.
70	M.	4	Left.	Admitted for pneumonia.	Exploration, Mar. 7. Resection, Mar. 10. Irrigation with weak iodine solution.	Pus, 9 ounces.	Cure.	7th day.	50th day.	51 days.	Temperature was hectic for a week, a fortnight before being discharged.

71	F.	4½	Right.	Acute onset, 3 weeks ago.	Resection, Aug. 12.	. . . . .	Cure.	?	?	60 days.	August 22, serous discharge. September 19, very little discharge. Discharged with a sinus.
72	M.	5	Right.	Cough, 3 months. Wasting, 2 months.	Resection.	Pus, 7 ounces.	Cure.	30th day.	32d day.	32 days.	Very much thickened pleura. Not much discharge on the ninth day after operation.
73	M.	5	Left.	Pneumonia, 7 weeks ago.	Aspiration, Sept. 3. Resection, Sept. 15.	Pus, 1½ pints. Pus, 1½ pints.	Cure.	?	Almost healed on 23d day.	32 days.	. . . . .
74	F.	5	Left.	Enteric fever, 5 months ago.	Aspiration, Oct. 2. Resection, Oct. 3.	Pus, 14½ ounces. Pus, 6 ounces.	Cure.	16th day.	18th day.	37 days.	Pointing between fifth and seventh spaces, just outside nipple line. Spleen pushed down.
75	F.	6	Right.	Ailing for 3 weeks.	Aspiration, Nov. 26. Aspiration, Nov. 29. Resection, Dec. 9. Irrigation with iodine solution.	Pus, 20 ounces. Pus, 13 ounces. Pus, 2 pints.	Cure.	15th day.	18th day.	40 days.	. . . . .
76	F.	6	Right.	Whooping-cough and broncho-pneumonia.	Exploration and resection.	Pus, 7 ounces.	Cure.	In 2 months.	?	12 weeks.	Very little discharge on the eighth day after operation. On the twenty-first the wound had to be enlarged on account of the ribs falling together.
77	F.	7	Left.	Acute onset, 10 days ago.	Exploration, May 20. Aspiration, May 21. Resection, May 23.	Sero-pus. <i>Nil.</i> 3 ounces of thin pus.	Cure.	17th day.	More than 23 days.	24 days.	Wound not quite healed when discharged.
78	M.	8	Left.	Sudden pain in the side, 6 weeks ago.	Exploration, June 11. Resection, June 13.	Pus, 24 ounces.	Cure.	8 weeks.	?	9 weeks.	A little purulent discharge four days before being discharged. Contracted chest. Spleen pushed down before operation. Lung expanded well after.

No.	Sex.	Age.	Side Affected.	Cause Assigned.	Mode of Treatment.	Nature and Amount of Fluid.	Result.	Tube Removed.	Wound Healed.	Duration of Treatment after Operation.	Remarks.
79	M.	8	Left.	Acute onset, with pain in the side, 16 days ago.	Aspiration, May 17. Resection, May 22.	Sero-pus, 2½ pints. Sero-pus, 12 ounces.	Cure.	36th day.	More than 41 days.	7 weeks.	Not much discharge noted on the 12th day after the operation.
80	M.	8	Right.	Pneumonia.	Aspiration, July 29. Resection, Aug 7. Irrigation with iodine solution.	Pus, 5½ ounces. Pus, 16 ounces.	Cure.	?	?	6 weeks.	August 7 to August 14, normal temperature. September 1 to September 5, hectic temperature. August 26, wound still open. September 19, discharged.
81	F.	8	Left.	Bronchitis, 4 months ago.	Resection.	Pus, 15 ounces.	Cure.	21st day.	?	33 days.	Pewter wire put in when the tube was removed.
82	F.	9	Left.	Acute onset, 5 weeks ago.	Resection.	Thick, greenish pus, 1 pint.	Cure.	21st day.	29th day.	37 days.	Markedly hectic temperature before the operation; subnormal subsequently.
83	M.	10	Right.	Cough, 5 weeks.	Discharging, Jan. 31. Resection, Feb. 20.	..... Pus, 6 ounces.	Death.	.....	.....	16 days.	Partial discharge through the lung and secondary pneumothorax. Died with severe abdominal pain. <i>Post mortem.</i> —A large empyema drained by the operation, and two smaller ones shut off by adhesions. Tubercle in the collapsed right lung. A bronchus of considerable size opened directly into the large empyema. Two small abscesses (pyæmic?) in upper lobe of left lung. Purulent peritonitis, about eight ounces of turbid fluid.

CASES OF DOUBLE EMPYEMA.

No.	Sex.	Age.	Side Affected.	Cause Assigned.	Mode of Treatment.	Nature and Amount of Fluid.	Result.	Tube Removed.	Wound Healed.	Duration of Treatment after Operation.	Remarks.
84	M.	11	Left.	Ill 2 months, aspiration.	Resection. Irrigation with boracic and sublimate lotion.	Very foul, thick, greenish pus, 8 ounces.	Cure.	60th day.	. . . . .	80 days.	A month previous to admission he was aspirated twice at another hospital, and no fluid found. Sinus present when discharged, and also six months after.
85	M.	3½	. . .	Broncho-pneumonia.	Exploration, right. Incision, left.	Nil. Ser o-pus, 10 ounces.	Death.	. . . . .	. . . . .	4 days.	Post mortem.—Extensive broncho-pneumonia of both lungs. Small, localized empyema on right side.
86	F.	6	. . .	3 weeks ill, gradual onset.	Right side: Aspiration, Aug. 2. Aspiration, Aug. 16. Incision, Sept. 2. Left side: Exploration, Aug. 23. Aspiration, Nov. 28.	. . . . . Pus, 5 ounces. Pus, 5 ounces. Pus, 5½ ounces. Pus, 2½ ounces.	Cure.	. . . . .	45th day.	Discharged Nov. 25.	Serous discharge from right side on fourth day after operation. An attack of acute nephritis began on September 17.

Of these eighty-six cases no less than eighty-four were cases of unilateral effusion. The patients have been under the care of seven different physicians, and the surgical treatment was carried out by a much larger number of surgeons, consequently there is considerable variation both as regards the treatment adopted and detail in the mode of operation.

Age.—Four cases were exactly a year old, none were under that age. Fifty-seven were under six years of age, twenty-seven between six and twelve; a proportion of incidence more than two to one in favor of the earlier half of the period of age under observation. Nearly a half, thirty-eight out of eighty-four, were between two and five years old. The average age of the whole series is about four and a half.

Sex.—There is no marked preponderance of either sex. The boys numbered forty-four and the girls forty.

Side affected.—Forty-one were on the right and forty-three on the left side.

Pointing.—Nine pointed before operation; of these eight were operated on and one ruptured.

Mortality.—Fourteen out of eighty-four died,—that is, 16.6 per cent.

Some of the statistics given by other observers are drawn from cases in children under ten years of age. In the present series six cases were between ten and twelve, and of these two died. In order to make the series parallel with the others these must be neglected and the reduced series then gives a mortality of twelve out of seventy-eight, or 15.4 per cent. Half of the children under two died.

TABLE A.

Analysis of the above Eighty-Four Cases of Unilateral Empyema.

Age.	Recovered.	Died.	Total.	Mortality, per cent.
1	2	2	4	50
1-2	4	4	8	50
2-3	10	2	12	16.6
3-4	7	1	8	12.5
4-5	15	3	18	16.6
5-6	7	0	7	0
6-7	8	0	8	0
7-8	5	0	5	0
8-9	6	0	6	0
9-10	2	0	2	0
10-11	1	1	2	50
11-12	3	1	4	25
Average age, 4½	70	14	84	16.6

The cases may be subdivided into four groups, according to the surgical treatment adopted.

TABLE B.

Group.	Treatment.	Cases.	Recovered.	Died.	Average Age.	Mortality, per cent.
I.	<i>Nil.</i>	4	3	1	4.6	25
II.	Aspiration.	12	12	0	4.75	0
III.	Incision.	35	28	7	4.6	20
IV.	Resection.	33	27	6	4.5	18.2

Analysis of Group I.—In only four out of the series was no surgical treatment adopted with a view to the evacuation of the pus. One of these (Case 2) died of pyæmia secondary to necrosis of a rib on the right side, an empyema being found on the left side post mortem. Recovery in the other three cases was slow, but by no means abnormally so, as compared with some of the cases treated by incision or resection. In Case 1 the effusion was reabsorbed; in Case 3 it was discharged through the lung, and in Case 4 it was partially reabsorbed and partially discharged through the lung. In these three much subsequent contraction of the side was recorded in the notes.

Analysis of Group II.—Cases treated by aspiration only. Aspiration was performed eighteen times in the twelve cases. In one pus was removed on three occasions. All, except two, consisted of small localized effusions. In seven the fluid re-collected after the first aspiration; four of these were treated by further aspiration, two were cured by absorption of the effused products, and one by partial absorption and partial discharge through the lung.

One case was aspirated three times and eventually ruptured externally, the patient making a good recovery. One case was aspirated and the cavity then irrigated with warm water, after which half an ounce of tincture of iodine was injected into the cavity and allowed to remain there; the patient appears, from the notes, to have done well.

Four of the patients were admitted with lobar pneumonia and three had a history of a probable pneumonia as the primary cause of the illness.

In no case is there any record of complete and perfect recovery, although such may have been the result and not have been noted. Considerable deformity was noted in five of the patients.

TABLE C.

Analysis of the Cases treated by Aspiration.

Average Age.	Sex.	Side.	Mortality.	Average Duration of Treatment after the Last Aspiration.	Remarks.
4 $\frac{3}{4}$	M. 9 F. 3	{ R. 4 L. 5 { R. 2 L. 1	{ { <i>Nil.</i>	6 weeks.	{ Recovery could not be regarded as perfect in most cases.

Of the whole series no less than forty were treated by aspiration; an analysis of these cases, as compared with the analysis of one hundred and twenty-one cases collected by Emmett Holt,¹ is given in the following table. It will be at once noticed that the only difference is in the mortality. The proportion of those requiring further operative treatment is practically the same.

TABLE D.

	No. of Cases.	Recovered.	Died.	Required further Operation.
Emmett Holt's series	121	23	6	92
Present series	40	12	0	28

Analysis of Group III.—Cases treated by incision and drainage. Of these thirty-five cases eighteen were treated by preliminary aspiration; some of them more than once. In four cases irrigation was employed as an adjunct to the treatment by drainage. Seven of the cases pointed before admission. One patient was discharged with a sinus still unclosed, but was subsequently admitted and cured by thoracoplasty. One patient was discharged cured, but was again admitted some time later for a small re-collection; an opening and counter-opening were then made and eventually she was discharged with a sinus left (Case 46). Table E shows the distribution of the cases and the mortality at different ages. It is especially noticeable that of four cases under two only one died, and of eight cases under three only two died.

TABLE E.

Age.	Recovered.	Died.	Total.	Mortality, per cent.
i	1	1	2	50
1-2	2	0	2	0
2-3	3	1	4	25
3-4	5	1	6	16.6
4-5	4	3	7	43
5-6	2	0	2	0
6-7	4	0	4	0
7-8	3	0	3	0
8-9	1	0	1	0
9-10	1	0	1	0
10-11	1	0	1	0
11-12	1	1	2	50
	28	7	35	20

The next table shows to a certain extent the length of time during which the tube was kept in and how soon the sinus closed. Unfortunately, in many cases one or other of these factors is not noted. The duration of the patient's stay in the hospital after the operation is also given.

¹ Archives of Pediatrics, vol. ix. 349, Emmett Holt.

TABLE F.

Average Age.	Sex.	Side.	Mortality.	Tube remained in the Sinus.	Sinus Closed.	Stay in Hospital Subsequent to Operation.
4.6	M. 15 F. 20	{ R. 6 L. 9 R. 8 L. 12	{ 20 per cent.	{ Average of 20 cases, 30 days. Limits, 1 to 9 weeks.	{ Average of 19 cases, nearly 7 weeks. Limits, 17 days to 5½ months.	Nearly 9 weeks.

Analysis of Group IV.—Cases treated by resection and drainage. Of these thirty-three cases ten were treated by aspiration before further treatment was adopted. In six cases irrigation was employed as an adjunct to the operative treatment by drainage. In only one did the abscess point before admission. Four patients were discharged with a sinus still unclosed. Table G shows the age distribution and mortality of the cases. The most important facts to note are that out of five patients under two years of age no less than four died, and of eleven patients under three, five died.

TABLE G.

Age.	Recovered.	Died.	Total.	Mortality, per cent.
1	1	1	2	50
1-2	0	3	3	100
2-3	5	1	6	16.6
3-4	2	0	2	0
4-5	7	0	7	0
5-6	3	0	3	0
6-7	2	0	2	0
7-8	1	0	1	0
8-9	4	0	4	0
9-10	1	0	1	0
10-11	0	1	1	100
11-12	1	0	1	0
	27	6	33	18.2

The next table shows the same details as Table F, with which it will be compared, and the same remarks apply to it.

TABLE H.

Average Age.	Sex.	Side.	Mortality.	Tube remained in the Sinus.	Sinus Closed.	Stay in Hospital Subsequent to Operation.
4.5	M. 16 F. 17	{ R. 9 L. 7 R. 8 L. 9	{ 18.2 per cent.	{ Average of 18 cases, 31 days. Limits, 1 week to 3 months.	{ Average of 19 cases, 29 days. Limits, 16 days to 7 weeks.	Average of 26 cases, nearly 7 weeks.

It is evident that this table is not of very great value as regards the duration of the sinus compared to the length of time that the tube remained in.

On comparing Tables F and H I find remarkably little difference. The average of the patients is practically the same. The mortality among the patients treated by incision is very slightly greater than the mortality among those treated by resection. The tube was kept in on an average almost the same length of time. The wound healed more slowly and the subsequent stay in the hospital was greater among those treated by incision, but the statistics are not sufficiently complete to warrant the deduction of any conclusion from them. It is also important to bear in mind that probably many of the cases treated by simple incision were more severe, in that they were of longer duration, for no less than eight out of the thirty-five pointed before admission; whereas only one of those treated by resection had pointed. In six of the cases treated by incision a counter-opening was also made; in three of these the counter-opening was made at the time of the first incision (Cases 23, 44, 50); in two it was made a month later, on account of insufficient drainage (Cases 29 and 41), and one of these died; in the other (Case 46) at a subsequent operation for letting out a small re-collection of pus. In Case 44 the sinus closed in thirty-eight days; in none in a less period.

The next table shows the percentage mortality of all cases under certain ages, treated by incision and resection. It shows in a most striking way that the mortality among the patients treated by resection gradually rises with the diminution in the age of the patient; on the other hand, the percentage mortality among those treated by simple incision remains very much the same, whatever the limit of age taken. I have limited the comparison to cases under six years of age for two reasons. First, we have an equal number of cases, treated by the two methods, under this age. Secondly, two-thirds of the cases in these series compared are under this age.

TABLE I.

Age.	TREATED BY INCISION.		TREATED BY RESECTION.	
	Number of Cases.	Mortality, per cent.	Number of Cases.	Mortality, per cent.
Under 6	23	26	23	21.7
“ 5	21	28.5	20	25
“ 4	14	21.4	13	38.4
“ 3	8	25	11	45.4
“ 2	4	25	5	80

Out of the whole eighty-four cases in the present series, fourteen died. Of these, five were boys and nine were girls. In six the effusion was on the right side and in the other eight it was on the left. The following

table shows the date after the operation on which the patient died and the cause of death. A post-mortem examination was not made in every case.

TABLE J.

Treatment.	Sex.	Age.	Side.	Date after Operation.	Cause of Death.	Remarks.
No operation.	M.	1 $\frac{2}{3}$	Left.	. . . .	Pyæmia.	The effusion was of quite secondary importance.
Incision.	M.	1 $\frac{3}{4}$	Left.	12th day.	General bronchitis.	No post-mortem.
	F.	2 $\frac{1}{2}$	Right.	16th day.	Exhaustion.	Frequent irrigation. Temperature hectic to end.
	F.	3 $\frac{1}{2}$	Left.	33d day.	General tuberculosis.	Recent tubercles in lung, liver, and meninges of brain.
	F.	4	Left.	32d day.	Erysipelas starting from the wound.	Frequent irrigation with carbolic lotion. No post-mortem.
	F.	4	Left.	36th day.	Syncope during irrigation.	Irrigation for three preceding days produced no alarming symptom.
	M.	4	Right.	5th day.	Purulent Meningitis of brain and spinal cord.	Also broncho-pneumonia and collapse.
	F.	11	Left.	10th day.	Pericarditis.	Also nephritis.
Resection.	M.	1	Right.	3d day.	Double pleurisy.	Ulceration of eyes, scalp, and finger.
	F.	1 $\frac{1}{4}$	Right.	31st day.	Exhaustion.	No sufficient cause found.
	F.	1 $\frac{1}{3}$	Right.	4th day.	Œdema of lungs and partial consolidation.	. . . . .
	F.	1 $\frac{7}{12}$	Left.	2d day.	Pericarditis.	Slight lobular pneumonia.
	F.	2	Left.	39th day.	Bronchitis.	Right lung carnified. Left lung partially collapsed.
	M.	10	Right.	16th day.	Peritonitis. Pyæmia.	Imperfect evacuation of a loculated empyema, opening into a bronchus.

On examining this table the most striking fact is that, among the cases treated by resection, five out of the six deaths occurred in children of two years of age or under; whereas only one of the deaths, among the seven treated by incision, was under that age. The earliest day on which a child died after incision was the fifth, and the cause of death was purulent meningitis. Except perhaps in one case of those treated by incision, a girl

who died from exhaustion on the sixteenth day and had a hectic temperature to the end, there is not a single death which could be ascribed to insufficient drainage. Unfortunately no post-mortem examination was made, so even in this case it is mere supposition to say that there may have been retained pus: it was, moreover, noted that the discharge remained sweet. Probably the cause of death was tuberculosis. Three patients, treated by resection, died on the second, third, and fourth days respectively. In one of these the cause of death was œdema of the lungs and partial consolidation, and I cannot help thinking that the shock of the operation conduced to the fatal result. One patient, a boy of ten, died of pyæmia and peritonitis; this was the only case, out of those on which a post-mortem examination was made, in which a loculated empyema was found.

From this table it is, I think, evident that in considering the relative advantages of incision *versus* resection we are justified in laying very little stress upon the percentage mortality, so many of the patients die from causes apparently unconnected with the operation, especially in the cases treated by incision.

STATISTICAL TABLES OF OTHER AUTHORS.

Dr. Griffith's Cases.

Reference.	Age.	Cured.	Died.	Total.	Remarks.
Medical Chronicle, vol. ix., J. Wardrop Griffith.	0-1	0	0	0	The two deaths occurred from advanced phthisis. Average duration of treatment after operation = six and one-half weeks. <i>Sex.</i> —Cured: M. 17; F. 9. Died: F. 1. <i>Mortality.</i> —2 out of 28 = 7.14 per cent. Records also two other fatal cases; one died two days after admission, before operation, and one was a double empyema.
	1-2	2	0	2	
	2-3	2	0	2	
	3-4	7	0	7	
	4-5	1	0	1	
	5-6	5	1	6	
	6-7	4	1	5	
	7-8	1	0	1	
	8-9	2	0	2	
	9-10	1	0	1	
	10-11	1	0	1	
	11-12	0	0	0	
		26	2	28	

Griffith's valuable paper is based on fifty successive cases of empyema, at all ages, treated at the Leeds General Infirmary. The surgical treatment was, in every case but one, carried out by himself or under his immediate supervision. The cases were treated by simple incision and drainage, and, as far as I can make out from abstracts, there does not seem to have been the least need of resection, on account of insufficient drainage, in any patient under twelve years old operated on, except one.

Dr. Morrison's Cases.

Reference.	Age.	Cured.	Died.	Total.	Remarks.
Lancet, 1894, ii. 738, Albert E. Morrison.	0-1	3	1	4	The cases occurred in general practice. The child under 1 year old was rachitic and died a week after operation of a fit. The other child died, on its third day, of bronchitis. Average duration of treatment after operation = thirty-two days. In most cases no subsequent deformity, except the scar, remained. <i>Mortality.</i> —6 per cent.
	1-2	2	0	2	
	2-3	4	1	5	
	3-4	4	0	4	
	4-5	8	0	8	
	5-6	2	0	2	
	6-7	5	0	5	
	7-8	0	0	0	
	8-9	2	0	2	
	9-10	2	0	2	
		32	2	34	

Dr. Wightman's Cases.

Reference.	Age.	Cured.	Relieved.	Died.	Total.	Remarks.
Lancet, 1894, i. 1128, J. P. Wightman.	0-1	1	0	2	3	Relieved, usually a sinus when discharged, which healed rapidly after. Average duration of cases known as cured = 8.8 weeks. Seven out of the one hundred and twenty-four cases were of double effusion, and of these six died. Therefore the mortality of unilateral effusion was 23 out of 117 = 19.6 per cent. Four cases might be discarded on various grounds, thus reducing the mortality to 16.8 per cent., 19 out of 113.
	1-2	7	1	7	15	
	2-3	8	1	9	18	
	3-4	13	2	3	18	
	4-5	12	3	3	18	
	5-6	11	3	3	17	
	6-7	10	3	2	15	
	7-8	3	1	0	4	
	8-9	5	0	0	5	
	9-10	1	1	0	2	
	10-11	4	1	0	5	
	11-12	2	2	0	4	
		77	18	29	124	

The cases occurred in the Infirmary for Children, Liverpool, during a period of six years.

The causes of death in the nineteen fatal cases were:

1. Pericarditis in ten; in eight of these it was purulent and in four it was associated with peritonitis.

2. Broncho-pneumonia in five.

3. Rupture into the lung in two; many sinuses in the substance.

4. Cellulitis of the chest wall in two; in one, associated with septicæmia.

Thus in no less than twelve out of the nineteen the cause may have been a primary septic condition or a secondary septic infection.

The next table shows the results obtained from treatment by simple incision and drainage, placed side by side. Each series is reduced, where necessary, to cases under ten years of age.

TABLE K.

Number of Series.	Reference.	Recovered.	Died.	Total.	Mortality, per cent.
I.	A. E. Morrison	32	2	34	6.0
II.	Wardrop Griffith	25	2	27	7.4
III.	J. P. Wightman	85	19	104	18.3
IV.	Present Series	26	6	32	18.7
Total.	. . . . .	168	29	197	14.7

Note.—Wightman's cases of double effusion are mixed up with those of unilateral effusion, and, as their age is not stated, this table may not be absolutely accurate.

It is curious that the mortality among the cases treated by many physicians and surgeons (Series III. and IV.) is practically the same. On the other hand, the mortality among each series of cases under one surgeon's treatment (Series I. and II.) is also practically the same, but strikingly less than in Series III. and IV.

I have only been able to avail myself of one series of cases treated by resection and drainage.¹ This is illustrated in the following table:

DR. BATTEN'S SERIES.

Age.	Recovered.	Died.	Total.	Mortality, per cent.
Under 1	1	0	1	0.0
1- 2	3	2	5	40.0
2- 3	13	3	16	18.7
3- 4	3	3	6	50.0
4- 5	7	0	7	0.0
5- 6	5	0	5	0.0
6- 7	5	0	5	0.0
7- 8	2	0	2	0.0
8- 9	0	0	0	0.0
9-10	1	0	1	0.0
	40	8	48	16.6

Unfortunately, in this table are included eight cases of double effusion of which three died. Resection was performed in only forty-five of the cases; the other three ought, therefore, to have been excluded. Further resection was required in five. Two cases pointed before admission. The eighth rib was the one most commonly chosen for the operation. One of the deaths was due to diphtheria when the empyema had almost healed, and another was a case of pyo-pericarditis, in which the effusion was found post mortem. Excluding all the cases of double effusion, the case which died of diphtheria and the one with pyo-pericarditis, the reduced series gives a total of thirty-eight cases, of which three died, a mortality of only

¹ Lancet, 1894, i. 1368, "Empyema in Childhood," F. E. Batten.

eight per cent. The causes of death in these three fatal cases were (1) peritonitis, death ten hours after admission; (2) died the day after admission, large vegetations being found on the tricuspid valve; (3) pyæmia, no post-mortem.

Comparison of Batten's series with the series under observation, treated by resection and drainage.

TABLE L.

	Recovered.	Died.*	Total.	Mortality, per cent.
F. E. Batten	35	3	38	8.0
Present Series	26	5	31	16.1
Total	61	8	69	11.6

On referring to the previous tables it is seen that the mortality of Batten's collected cases is rather greater than Morrison's and Wardrop Griffith's. On the other hand, it is considerably less than Wightman's, whose cases were also collected from a children's hospital. Only three of Batten's cases under two years old were cases of single effusion, and they recovered.

GENERAL CONSIDERATIONS.

Granted that pus has been diagnosed in the pleural cavity, and the diagnosis verified by exploration, the case may be left to nature or the fluid must be removed.

An unoperated-on empyema has three courses open to it :

1. It may be reabsorbed. In such an event the fluid parts are first absorbed; the solid parts undergo fatty degeneration or necrosis and are then also absorbed, or a caseous mass may be left behind and be a dangerous focus for future mischief.

2. It may rupture externally, through the chest wall, leaving a chronic sinus which heals with difficulty.

3. It may rupture internally, through the lung or into a bronchus. In very rare cases the rupture may be into the œsophagus.

All these courses are slow and dangerous. The first is the most favorable result, and occurs most commonly in cases secondary to pneumonia. Such reabsorption occurred in Case 1; also in three cases treated by aspiration, for in these it was noted that the fluid reaccumulated after aspiration and was subsequently slowly reabsorbed.

External rupture occurred in Case 12, one which had been treated by aspiration. In eight other cases rupture was averted by timely operation.

One of the cases untreated by surgical interference (Case 3) discharged through the lung; another (Case 4) discharged partially through the lung and was partially reabsorbed. A few of the cases, surgically treated, discharged partially through the lung; in one of these a direct opening into a good-sized bronchus was found post mortem.

It is in cases left to nature only that we most commonly see the characteristic sequelæ of the complaint, such as a chronic sinus, deformed chest, shrunk side, approximated ribs, depressed shoulder, curvature of the spine, diminished movement of the chest, displaced heart, fibroid changes in the lungs, tuberculosis, and lardaceous disease. The usual condition of the lung is one of great diminution in size; it is solid, carnified, retracted into the angle formed by the ribs and vertebral column, and covered by a dense layer of thickened pleura from whose inner surface dense strands of fibrous tissue penetrate into the substance of the lung.

Similar results occasionally ensue in cases treated on approved methods but of long continuance before reaching the surgeon's hands. This is not, however, a necessary sequence, for we frequently see complete re-expansion of the lung, even in cases of long-standing effusion, after evacuation.

The mortality of untreated cases is usually large. According to the statistics of Rilliet and Barthez, twenty-one died out of thirty-three cases which were not treated surgically. That cases left to nature do undergo absorption and ultimately are perfectly cured is undoubtedly true. Russell¹ records two cases of children who had pneumonia and subsequent effusion of pus, and diagnosis being proved by exploration, in both the effusion cleared up in a few days.

It is clear, therefore, that, in spite of the dictum of Solis-Cohen, that "the absorption of pus is in practice a myth," some small purulent effusions are reabsorbed and the patient makes an excellent recovery.

It is still more clear that such a result is very uncertain, and that the risks incurred by a policy of non-intervention, both as regards life and subsequent deformity, far outweigh the risk of surgical interference.

I most emphatically maintain that in every case of empyema in children the only sound treatment is to evacuate the pus.

In addition to this evacuation we must aim at preventing reaccumulation, at procuring complete re-expansion of the lung, and at leaving behind no deformity of the chest wall or spine.

To a certain extent our method of evacuation may depend upon the nature of the fluid effused. Absorption has been shown to be a possibility in cases due to the pneumococcus; if therefore a large part of the effusion be removed by aspiration, the remainder may be absorbed. It is a very simple plan to remove a few drops of the fluid by means of a sterilized syringe and to examine it, both microscopically and bacteriologically. If streptococci are found, it is exceedingly improbable that the case will result in cure by absorption; on the other hand, if only pneumococci be found, such a result is a possibility.

Advantages of Aspiration.—It is useful in cases of urgency, and in cases of double effusion, as a temporary expedient for removal of the pus from one side of the chest. If the effusion is very large it is sometimes

¹ British Medical Journal, 1893, i. 949, W. B. Russell.

an advantage to remove some of it before performing the major operation ; by such a measure the size of the cavity is diminished and the lung is enabled to re-expand. It is the only available means for removing the pus, when, owing to the ignorance or stupidity of the parents, it is impossible to gain consent to more radical treatment. No open wound is made.

Disadvantages of Aspiration.—A thin purulent fluid will pass through the canula readily, but a thick one, or one containing flakes of lymph, soon blocks it up and prevents any further flow. It is impossible to remove all the contents of the cavity and consequently an irritating focus remains, and, as a rule, the fluid re-collects, often with most extraordinary rapidity. If the operation be carried out too rapidly, there is danger of rupture of some of the air-vesicles and the production of pyo-pneumothorax, or of the production of serous œdema of the opposite lung.

Undoubtedly cases are cured completely by simple aspiration. Carmichael showed, before the Edinburgh Medico-Chirurgical Society on February 6, 1889, two children who had recovered perfectly under this treatment. Bontor¹ recorded cases, of a boy two and a half and a girl seven, from each of whom eight ounces of pus were removed by aspiration, after which they recovered perfectly, the two sides of the chest being absolutely symmetrical, in the boy eight months and in the girl six months after the operation. In Bontor's cases the fluid was serous at first and subsequently became purulent, the assigned cause of the effusion being broncho-pneumonia. In the present series of twelve cases cured by aspiration there is no note of perfect cure having resulted from the treatment, although such may have been the termination. As is usual in a large general hospital, the patients are lost sight of when discharged.

Other methods of removal of the fluid without making an open wound are sometimes employed,—*e.g.*, puncture with a trocar and canula ; siphon aspiration by means of a trocar and canula and a long tube leading into an antiseptic fluid, and so arranged that air cannot enter the chest ; aspiration combined with subsequent irrigation ; aspiration followed by irrigation and the injection of tincture of iodine,—constant aspiration. None of these can I recommend except the method of siphon aspiration, which, personally, I prefer to the use of the aspirating bottle. If the bottle be used, it must be only partially exhausted at first and the pump then worked very gently while the fluid is running. The canula should be withdrawn if the fluid becomes blood-stained or much coughing be excited.

Supposing one aspiration does not cure the patient, in spite of the fact that some cases are cured by repeated aspiration, I am strongly opposed to such a line of treatment. A favorable result is improbable, and the prolonged illness and suppuration render the patient less able to undergo the more serious operation of drainage.

¹ British Medical Journal, 1892, i. 1073, S. A. Bontor.

The two methods of drainage commonly employed are (1) incision and (2) resection, either of which may be supplemented by irrigation.

Advantages claimed for Resection over Simple Incision.—1. That better drainage is secured; 2, that the boundaries of the cavity can be explored and all loose adhesions broken down; 3, that there is less danger of hemorrhage; 4, that the chances of a perfect cure are better; 5, that recovery is more rapid.

Advantages claimed for Incision over Resection.—1. That the operation is simpler and more quickly performed; 2, that the shock is less; 3, that there is less risk of pyæmia, the medullary cavity of a rib not being laid open; 4, that drainage can be secured quite efficiently and that consequently the more severe operation is unnecessary.

Huber,¹ in an experience of at least a hundred cases—four double—of empyema in children, found no difficulty in inserting a tube. He has repeatedly shown that an India-rubber tube, from three-eighths to one-half inch diameter, can be readily introduced through an intercostal space of a child under one year of age. Neither Morrison nor Wardrop Griffith found any difficulty in the matter of drainage, except in one case of the Griffith series, and of the present series, in only one case (No. 28) would resection have been a better method of treatment. This was a patient, with a history pointing to long-continued effusion, in whom the ribs were so close together that, although she was three and a half years old, a drainage-tube would not pass between. Even if the tube be a little compressed at first, on the next day it will be found expanded to its full diameter. In the last two cases under my own care (Nos. 17, 20) drainage was easily and amply secured without resection. In one, a girl twelve months old, the sinus closed on the seventeenth day; in the other, a girl twenty-three months old, it closed on the eighteenth day, although there was a history of a duration of illness for three months. In both the lungs expanded fully and the two sides of the chest were symmetrical when the patients were discharged.

Certainly, when resection is performed, it is easy to insert the finger and break down adhesions. To my mind this does not seem an unmitigated blessing, for there is a danger of causing a much more extensive pleural inflammation and converting a local into a general empyema. As regards hemorrhage, to judge by the present series of cases, there does not appear to be much risk of serious bleeding under either method of operating. It is only necessary to remember, in order to avoid such a complication, that the artery runs along the under border of the rib.

The assertion that the chances of a perfect cure are better under treatment by resection is not supported by clinical experience. On referring to the present series it is found that of the patients treated by resection more were discharged with a sinus than in the case of those treated by incision. The duration of time during which the sinus is kept open

¹ Archives of Pediatrics, x. 850, F. Huber.

depends upon the length of time that the tube is kept in ; this depends mainly upon the fancy of the operator. It is on this fact that the length of the subsequent treatment depends, and not upon any special virtue of resection. Early contraction of the side is more likely to follow resection than incision ; it is not a sequel to be aimed at.

Indications for Resection.—1. Where the ribs are so close together that it is impossible to drain the cavity without. This is a condition that very rarely occurs in children, and is only likely to be found in long-standing cases.

2. When drainage is found subsequently to the simpler operation to be imperfect, the indications consisting in a high temperature and an offensive discharge.

3. When the lung has re-expanded and the chest wall contracted and yet the sinus does not close. Resection of portions of several ribs is generally required in such cases.

The Anæsthetic.—Neither chloroform nor ether is contra-indicated, and, as a rule, general anæsthesia is preferable to local, more especially if exploratory punctures are required before proceeding to the operation. The anæsthetic, especially if it be chloroform, must be given with very great care in cases of large effusion on the left side of the chest, in cases of prolonged duration, and in cases of double effusion ; in such, local anæsthesia by ice or cocaine may be preferable. While the patient is under the anæsthetic it is better to complete the operation as the patient lies on the back ; serious collapse sometimes follows the turning on the side, frequently adopted.

The Site of the Operation.—In localized effusions this will necessarily vary with the situation ; it is advisable to make the incision as nearly as convenient over the centre of the dull area, having previously proved by exploration the presence of pus in the situation chosen. In a general effusion the fifth space in the mid-axillary line, or between that and the posterior axillary line, is the most convenient for both patient and surgeon, and the most satisfactory for drainage. An incision in any space below the seventh on the right side and the eighth on the left entails a certain amount of risk to the diaphragm. Although below these limits may be found the most dependent part of the cavity when the patient is sitting up, it is not so when the patient is lying on the back. In a child on its back the most dependent part of the pleural cavity is in the posterior axillary line or just in front of it.

If the opening be made lower down, especially on the right side, it is liable to be closed by the flap valve action of the diaphragm, which ascends very high in children. Some surgeons prefer to make the opening more posteriorly, under the impression that the cure of an empyema depends upon the action of gravity, whereas gravity is of comparatively small importance. The three main factors which lead to the obliteration of the cavity are :

1. Expansion of the lung : this is by far the most important and also the most efficient aid in procuring proper drainage.

2. The ascent of the diaphragm.

3. The falling in of the chest wall: a result by no means to be desired before the opening has closed and the lung has regained as much of its expansion as possible.

The Operation.—Surgical details can be found in any text-book. It is advisable to explore at the point where it is proposed to make the incision; to use a large needle, an ether-syringe is as useful as any more complicated apparatus; and to explore in several regions if pus is not obtained at the first attempt and if the physical signs and symptoms indicate that a purulent effusion is present. Of course, the usual precautions to prevent infection by dirty implements must be employed; they are simple and easily carried out, and there is practically no risk of converting a simple serous into a purulent effusion, even by several explorations.

The Management of the Tube.—In this lies a large part of the success of the treatment. In the first place it is absolutely unnecessary to use a long tube. Let the calibre be as large as convenient and use a tube about two inches long. The practice of using a long tube appears to have originated in a misconception that the healing of an empyema depends upon the cavity being closed by granulations and that it must heal from the bottom.

As long ago as 1876 Fräntzel¹ stated his belief "that the whole of the pleura pulmonalis and costalis, after it has thrown off the various necrosed masses, becomes covered with granulations. These become adherent, adhesion begins most commonly near the root of the lung and spreads from thence. The hitherto compressed lung, by fits of coughing and other expiratory efforts with a more or less closed glottis, fills itself with air from the sound lung." Erichsen, also, in his standard work on surgery, speaks of the wound and sinus healing by granulation. But it is not the cure by the slow process of granulation that we must regard as the *summum bonum* of treatment. What is really required is a rapid and complete re-expansion of the lungs, and it is a distinct disadvantage if adhesions form before the lung is fully expanded and the opening closed.

It is advisable to use two tubes, changing them daily. Some rubber tubes contain an excess of sulphur, and a new tube of this kind, inserted in place of one which has been used daily for some time, may cause a temporarily increased purulent discharge on account of its irritating chemical properties. This increased discharge, together with an offensive smell due to the evolution of sulphuretted hydrogen, may lead the surgeon into supposing that the case is going to the bad and that some further treatment, such as irrigation, is required.

The Duration of Drainage.—Erichsen states that "in children, especially if the opening has not been deferred too long, the wound may be allowed to close after a month." Unfortunately too much hospital practice is based on assertions like this. Time after time do I find, in the notes of the

¹ Von Ziemssen's Cyclopædia, vol. iv., 1876, Fräntzel.

above series of cases, the words "discharge scanty and serous," and yet the tube is allowed to remain *in situ* until the surgeon finds that the discharge is again purulent and he flatters himself on his prudence and foresight in not removing the tube. Sutherland—and I agree with him absolutely—states that the opening should be regarded purely as a temporary exit for the fluid. In almost every case it will be found that soon, sometimes in two or three days, the discharge becomes sero-purulent or even serous and that it rapidly becomes scanty, then is the time to remove the tube. Any tube, much more so when it is a long one, will keep up irritation and lead to a prolonged discharge. After it is removed the wound remains open a few days and allows any superfluous fluid to escape. I have no doubt that, if this practice of early removal of the tube be carried out, it will be found that the recovery of cases of empyema will not only be more rapid but more perfect than is usually the case at present. Occasionally it happens, when the wound is allowed to close too soon, that a small amount of pus re-collects under the site of the scar; it can be readily evacuated by a simple incision and treated as a simple abscess.

Sutherland recommends removal of the tube as early as the third day in some cases, and records perfect results under such treatment. No hard and fast rule can be laid down, except that the tube must be removed early, as soon as the discharge is serous and scanty.

The Cavity.—Air must not be allowed to enter. Practically, at the time of the operation, this cannot be prevented, but it does not appear to do any harm. As soon as the tube has been inserted and the dressings applied the air is driven out again by the expansion of the lung and the ascent of the diaphragm, and the dressings, acting as a kind of valve, prevent it re-entering. Great care must be taken to fix the tube in some way so as to prevent it slipping into the cavity; cases are not unknown in which such an accident has happened and given rise to a prolonged discharge. Exploration of the cavity is sometimes adopted at the time of operation, especially in cases where resection of a part of a rib has been performed; the finger is introduced and used to determine the extent of the cavity, to scrape away adherent lymph, and to break down adhesions. Beyond the gratification of an idle curiosity it does not seem to me that any advantage is gained by thus further complicating a simple operation. On the other hand it is frequently urged that the breaking down of adhesions in this way allows of earlier and more complete expansion of the lung.

Blake¹ records six cases of children treated in the Northeastern Hospital for Children after the following method. A portion of the rib was excised, the fluid pus run out, and the flaky semi-organized lymph removed with a sharp spoon; four ounces of iodoform emulsion were run in and one ounce was allowed to remain in the cavity. In all the wound healed in twelve to fourteen days, one died later from broncho-pneumonia on the

¹ Lancet, 1889, i. 326, Blake.

same side. There is danger of iodoform poisoning with no particular advantage gained by this mode of treatment, and the good results were due more probably to the early removal of the tube, on the 9th to 11th, than to the treatment of the cavity.

Irrigation is another adjunct to treatment by simple incision or resection; occasionally it has been employed after aspiration. It may be adopted at the time of operation or subsequently. Warm water, various dilute antiseptic solutions, or "perflation," after the method advocated by Dr. Ewart¹ some years ago, can be employed. A solution of perchloride of mercury, one in five to ten thousand, is the best and safest. Carbolic acid should never be used, on account of the susceptibility of children to poisoning by that agent.

The advantages claimed for this treatment are that all pus, whether fluid or solid, is removed, thus removing the source of irritation, and that the cavity is rendered aseptic. The disadvantages are that syncope may be induced and adhesions broken down. Syncope occurs at times in cases where irrigation has been used many days subsequent to the primary operation, as in Case 34. Moreover, the treatment is unnecessary: pus and lymph which will come away on gentle irrigation, and forcible irrigation is certainly dangerous, will come away with equal readiness in the course of twenty-four hours or so without. Irrigation is only permissible in cases of fetid effusion, an exceedingly rare primary condition in children. Either weak sublimated lotion or tincture of iodine, a drachm to the pint, is the most suitable.

Causes of Bad Results.—No matter what treatment is adopted, there will always be a small proportion of cases which do not recover or are left with a chronic sinus or develop some complications. The chief causes of such unsatisfactory results are as follows:

1. Prolonged duration of the effusion previous to evacuation. In such cases the lung is so bound down by adhesions and so altered in structure by the ingrowth of fibroid tissue from the pleura that it is unable to expand. Such a condition is not a necessary sequence of long-continued effusion; in some of these cases rapid and complete expansion ensues.

2. Partial discharge through the lung. If there is a fairly free communication with a bronchus, the lung cannot expand.

3. Syncope during the operation or on subsequent irrigation.

4. Pyæmia.

5. Various complications; chiefly broncho-pneumonia or tuberculosis.

DOUBLE EMPYEMATA.

I have collected twenty cases recorded in various journals and periodicals. To these are added two from the above series, and fifteen referred to by Batten and Wightman in their papers, making a total of thirty-seven. These latter fifteen are only imperfectly recorded.

¹ British Medical Journal, 1886, ii. 226, and 1887, i. 595, W. Ewart.

Reference.	Sex.	Age.	Mode of Treatment.	Nature and Amount of Fluid.	Interval between the Operations.	Result.	Course.	Remarks.
Lancet, 1892, i. 1299, Deanesley.	..	1½	Left, resection. Right, <i>nil</i>.	.....	.....	Sudden death.	Died on 12th day.	Effusion on the right side was diagnosed the day before death.
Lancet, 1894, i. 1439, Sutherland.	F.	2½	Right, resection and irrigation. Left, resection and irrigation.	Much thin, greenish pus. ?	12 days.	Cure.	Each tube was removed on 3d day.	Influenza assigned as the primary cause.
Lancet, 1880, ii. 617, Sangster.	M.	2	Right, incision. Left, aspiration two times.	.....	5 days.	Cure.	.....	Five days between the drainage of the right side and the first aspiration of the left.
Medical Chronicle, vol. ix. p. 444, Wardrop Griffith.	M.	3	Right, incision. Left, incision.	Pus, 2 ounces. Small amount.	3 months.	Death.	Right wound healed in about 11 weeks.	Temperature did not come down even after the second operation. Died ten weeks after. <i>Post mortem</i> .—Great wasting. No tuberculosis.
Aertzel. Intell.-Blatt, Münch., 1883, Brauser.	M.	3	Right, incision and irrigation. Left, incision and irrigation.	.....	.....	Cure.	Wound healed on each side in 7 weeks.	.....
St. Barth. Hosp. Journ., 1894, Cantley. Case 85 in above series.	M.	3½	Right, exploration. Left, incision.	<i>Nil</i> . Ser o - p - u - s, 10 ounces.	2 days.	Death.	Temperature rose rapidly after the operation. Reached 105° on 3d day, just before death.	Admitted a week before exploration, with broncho-pneumonia and signs of effusion at right base. Exploration in two places failed to find pus. Effusion on left side came on in the next two days. <i>Post mortem</i> .—Small localized empyema in right axilla. Extensive broncho-pneumonia of both lungs and considerable collapse of the left. Thick lymph covering left pleura.

Reference.	Sex.	Age.	Mode of Treatment.	Nature and Amount of Fluid.	Interval between the Operations.	Result.	Course.	Remarks.
New York Med. Journ., vol. lii., Westbrook.	F.	4	Right, incision. Left, aspiration five times; incision.	Pus, 20 ounces.	2 months.	Cure.	Tube out: right, 13 weeks; left, 7 weeks. Wound healed in another 7 and 10 days.	The first aspiration was done six days after the incision on the right side. Consent to the second incision could not be obtained earlier.
Lancet, 1894, i. 1439, Sutherland.	M.	5	Left, resection and irrigation. Right, resection and irrigation.	Pus, 5 ounces.	1 month.	Cure.	Tube out: right, 14th day; left, 13th day. Wound healed: right, 7 weeks; left, 4 weeks.	Cause assigned, pneumonia.
Lancet, 1894, i. 1439, Sutherland.	F.	5	Right, resection and irrigation. Left, resection and irrigation.	. . . . .	1 month.	Cure.	Tube out: right, 3d day; left, 10th day.	Cause assigned, bronchitis and pneumonia. (?)
Archives of Pediatrics, vol. vi., Huber.	. .	5½	Double incision, irrigation, and drainage.	. . . . .	10 days.	Cure.	Wound healed: right, 8 weeks; left, 10 weeks.	Cavities irrigated every third day.
Lancet, 1888, ii. 114, Blunt and Okell.	M.	5¾	Right, resection. Left, incision.	Pus, 30 ounces. Pus, 9 ounces.	5 days.	Cure.	Wound healed: right, 7 weeks; left, 4 weeks.	The left effusion was cured more rapidly by simple incision than the right by resection; on the other hand, it was much smaller.
Lancet, 1894, i. 1439, Sutherland.	M.	6	Right, resection and irrigation. Left, resection and irrigation.	. . . . .	5 months.	Cure.	Tube out: right, 4th day; left, 12th day.	The two illnesses were quite distinct, so this case should not be strictly included in the present category.
Archives of Pediatrics, vol. ix., Huber.	M.	6	Right, incision and irrigation. Left, incision and irrigation.	Pus, 20 ounces.	6 days.	Cure.	Tube out: right, 9 weeks; left, 8 weeks. Wound healed: right, 4 months; left, 9 weeks.	Illness began with right lobar pneumonia. A small collection of pus under the operation wound (one ounce) on the right side delayed healing.

Lancet, 1890, ii. 124, Morgan and Mitchell Bruce.	M.	6	Left, aspiration. Right, aspiration. Left, aspiration. Left, resection. Right, resection.	Pus, 8½ ounces. Pus, 22 ounces. Pus, 4 ounces. Much pus.	12 days between the re- sections.	Cure.	Wound healed: right, 4 weeks; left, 5 weeks.	Cause, pneumonia. Double effusion existed when first seen.
Case 86 in above series.	F.	6	Right, aspiration, Aug. 2. Right, aspiration, Aug. 16. Left, exploration, Aug. 23. Right, incision, Sept. 22. Left, aspiration, Nov. 8.	Pus, 5 ounces. Pus, 5 ounces. Pus. Pus, 5½ ounces. Pus, 2½ ounces.	. . . . .	Cure.	Wound healed in 45 days.	Both empyemata were small. The one on the left side was caused by a single aspiration.
Clinical Society Transactions, vol. xxiv, Coupland and Gould.	F.	7	Right, aspiration, resection. Left, aspiration, resection.	Pus, 10 ounces. Pus, 18 ounces.	9 days.	Cure.	Duration after operation: right, 5 weeks; left, 6 weeks.	Aspiration was done several times on each side. Child was much collapsed at each operation of resection.
Lancet, 1891, i. 1385, Handford.	M.	7½	Left, resection. Right, resection.	Much pus. Much pus.	10 days.	Cure.	Tube out: left, 9 weeks; right, 12 weeks. Wound healed: left, 12 weeks; right, 15 weeks.	Three-fourths inch of rib was removed at the first operation; the child became much cyanosed under the chloroform, but was relieved when the chest was opened.
Clinical Society Transactions, vol. xxvi, Carr.	M.	7½	Left, aspiration, resection. Right, resection.	Pus, 7 ounces. Pus, 8 ounces.	4 days.	Cure.	Wound healed: left, 9 weeks; right, 3 months.	Local anaesthesia employed at each operation. Ten minims of cocaine, twenty per cent. solution.
Liverpool Med. Clin. Journ., 1893, Marsh.	M.	8	Right, incision. Left, aspiration on the next day, incision.	Pus, 20 ounces. Pus, 12 ounces.	4 weeks.	Cure.	Duration after operation: right, 4½ months; left, 5 weeks.	. . . . .
Annals of Surgery, 1893, xvii. 410, Warbasse.	F.	10	Right, resection. Left, resection.	. . . . .	. . . . .	Cure.	Wound healed: right, 17 days; left, 17 days.	. . . . .

Reference.	Sex.	Age.	Mode of Treatment.	Nature and Amount of Fluid.	Interval between the Operations.	Result.	Course.	Remarks.
Lancet, 1892, i. 1299, Deanesley.	F.	10	Left, aspiration, resection. Right, aspiration, resection.	. . . . .	11 days.	Cure.	Wound healed: left, 6 weeks; right, 4 weeks.	Right effusion small and localized.
Lancet, 1894, ii. 84, E. L. Fox.	F.	12	Simultaneous incision.	Pus, 60 ounces.	A few minutes.	Cure.	Tubes out in 3 to 4 weeks.	A lumbar abscess was opened at the same time. No change noted after the incision was made into the second pleura.
Lancet, 1894, i. 1368, Batten. cases.	. .	1	. . . . .	. . . . .	. . . . .	Cure.	. . . . .	. . . . .
		1	. . . . .	. . . . .	. . . . .	Cure.	. . . . .	. . . . .
		1½	Resection on right side.	. . . . .	. . . . .	. . . . .	. . . . .	Double empyema found post mortem.
		2	Resection on one side.	. . . . .	. . . . .	. . . . .	. . . . .	Died of diphtheria. Double empyema found post mortem.
		2½	Resection on left side.	. . . . .	. . . . .	. . . . .	. . . . .	Right aspirated two days before death.
		5	. . . . .	. . . . .	. . . . .	Cure.	. . . . .	. . . . .
		5	. . . . .	. . . . .	. . . . .	Cure.	. . . . .	. . . . .
		7	. . . . .	. . . . .	. . . . .	Cure.	. . . . .	. . . . .
Lancet, 1894, i. 1128, Wightman. 7 cases.	. .	. .	. . . . .	. . . . .	. . . . .	Recovered, 1; died, 6.	. . . . .	Extensive broncho-pneumonia, three; suppurative pericarditis, two; uncomplicated, two.

Of the twenty-two fully recorded cases only two died, and in these one side alone had been operated on. In one the cause of death was extensive broncho-pneumonia, incision and drainage being the treatment adopted for the effusion on the left side two days before. In the other sudden syncope occurred on the twelfth day after resection and drainage on the left side. In two cases a cure was effected by simple incision and drainage on the right side and aspiration only on the left.

Resection was performed twenty-two times and in eight of these was combined with irrigation.

Simple incision was the favored operation sixteen times and in six was combined with irrigation.

Thus, we find that irrigation was employed no less than fourteen times in thirty-eight operations; a proportion very much greater than in cases of unilateral empyema.

No doubt the small percentage mortality, hardly ten per cent., in these cases is due to the fact that successful cases are generally recorded and that some cases are only diagnosed post mortem. Of the eight cases referred to by Batten only three died: one from diphtheria; in one the right side alone was operated on; in the third the left side was operated on and the right side aspirated. Wightman refers to seven cases, of which no less than six died, three from extensive broncho-pneumonia, two from suppurative pericarditis, and one uncomplicated. Details are unfortunately wanting.

The Treatment.—Godlee, in Heath's "Dictionary of Surgery," states that "if a general empyema has been opened and another form on the opposite side, it is obvious that the only surgical treatment for the second collection is by aspiration."

Coupland and Gould,¹ on the other hand, assert that "to open a double empyema cannot lead to collapse of the lung," because adhesions are always present and prevent any further collapse. In other words, general empyema does not exist, an assertion which is certainly not verified by post-mortem experience.

Both these statements are much too dogmatic. No doubt it is very rare to find double general empyema, yet we are not justified in concluding that such a condition does never occur. As a general rule each effusion is localized; sometimes one is small and localized and the other general, as in the fatal case under my own care. Provided that one is localized and the other general, it is by no means necessary to limit the treatment of the second effusion to aspiration only.

The best treatment to adopt is simple incision and drainage, allowing an interval of a few days to elapse between the two operations. Even more than in cases of unilateral effusion do I think it unjustifiable to submit the child to the more severe operation of resection. The treatment should be

¹ Transactions of the Clinical Society, vol. xxiv., Coupland and Gould.

modified according to the nature of the cases, which may be divided into three classes :

1. Cases of double general effusion. It is better to aspirate first on both sides in order to diminish the quantity of fluid and relieve the heart from the encumbrance to its action. Next day operate on one side, and a few days to a week later operate on the other. The left side should be chosen for the first operation, and local rather than general anæsthesia employed.

2. Cases of general effusion on one side and localized effusion on the other. Evacuate the general effusion first and repeat the operation on the other side a few days later.

3. Cases of double localized effusion. Simultaneous drainage may be adopted, but, though not necessary, it is a wise precaution to wait a few days between the two operations.

GENERAL SUMMARY.

1. When pus is found to be present in the pleural cavity the proper treatment is to remove it.

2. The best method to adopt for its removal is simple incision and drainage.

3. The best site for the operation is the fifth space in the mid-axillary line.

4. Irrigation is unadvisable, and is indicated only in cases of fetid effusion.

5. Exploration and scraping of the cavity are not necessary.

6. Resection of rib is practically never necessary in children as a primary procedure to procure efficient drainage.

7. Resection of rib may be necessary to secure the closure of the sinus, subsequently, by allowing the chest wall to fall in.

8. Collapse of the chest wall is not a result to be desired in the early stages of the treatment.

9. Rapid and complete expansion of the lung is the great object of treatment.

10. The tube must be removed early.

CROSSED KNEE-JERK, OR CONTRA-LATERAL ADDUCTOR REFLEX.¹

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THE phenomenon of crossed knee-jerk on striking the patella tendon has been observed frequently by the writers at the Infirmary for Nervous Diseases in Philadelphia, and it was at Dr. Weir Mitchell's suggestion that they have made some investigation of this subject as embodied in this report. Aside from the foreign observations, we have been unable to find that any statements have been made on this subject by American authors.

In using the term crossed knee-jerk it is not claimed that this entirely describes the phenomenon under consideration. What is meant is that, the knee tendon being struck, the opposite leg is instantly made to approach its fellow. Hence the phrase "in knee-jerk" or "contra-lateral adductor reflex" might better describe the action, though it has been most difficult to find a descriptive title for this process or act. Nor is it to be confused with the production, by a blow on one knee, of a knee-jerk or direct extension in the opposite member, as sometimes happens. The movement observed in the limb opposite to that in which the patella tendon is struck is not an extension of the leg so much as an adduction of the thigh (*vastus internus* and *crureus*), which has suggested the German name *adduktoren reflexe*.

The measurements used clinically are close estimates by the eye of the excursus which the other knee makes *across* towards the one receiving the blow. More accurate measurements were made by means of an apparatus constructed to record on paper the actual amount of adduction in the two limbs on striking a patella tendon. This was accomplished by attaching to corresponding points in either knee, threads, each of which raised an index, free to move vertically, so that they recorded on an upright cylinder the actual amount of movement, as seen in the vertical lines in the accompanying cut.

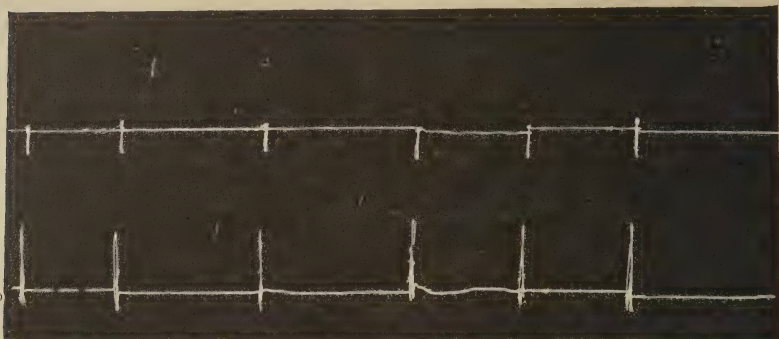
In normal individuals, in whom the knee-jerk is readily obtainable, a slight inward movement of the opposite limb can in many cases be observed. About twenty or thirty per cent. of the patients coming to the clinic of the Infirmary for Nervous Diseases show this symptom.

The attitude of the subject which best admits of this study is not that which permits of the freest knee-jerk, such as sitting on the edge of a table

¹ Read at the annual meeting of the American Neurological Association at Washington, D. C., June 1, 1894.

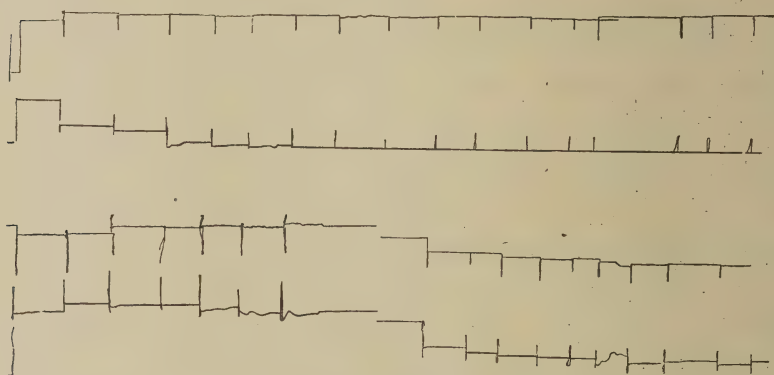
or with the leg hanging down from a chair sufficiently high. It demands rather more ease of lateral motion to the thigh. This is accomplished very

FIG. 1.



The upper vertical lines measure the actual amount of adduction of the thigh whose patella tendon was struck. The corresponding lower vertical lines measure the adduction of the opposite thigh. Record of six taps.

FIG. 2.



Normal tracing.

well by seating the subject at ease in a chair, with the body erect, the knees a foot apart, and the knee at a rather obtuse angle, the feet being advanced a few inches in front of the perpendicular line falling from the knee.

In the cases examined it occasionally transpired that this phenomenon—this adductor reflex—failed to appear until reinforced. Usually some motor reinforcement was employed, as the clenching of the hand or a grimace, whereupon the action was more or less conspicuous.

In cases where the movement is slight the suspicion may arise that it is not a true reflex, but may be due to mechanical jarring of the pelvis communicated from the blow. A merely mechanical action would not seem possible to explain the excess of adduction of the opposite limb on striking the tendon of a subject who showed the movement to a marked degree and,

on the other hand, its complete absence in all cases of locomotor ataxia in which no knee-jerk was obtained.

In order to eliminate the possibility of communicating force to the pelvis while eliciting knee-jerk, we employed suspension of the subjects. Two patients suffering from lateral sclerosis, and in whom the crossed knee-jerk was readily obtained, were suspended. It was found that a tap on the patella tendon of either side elicited the crossed reflex. The contraction of the adductor muscle of the thigh was distinctly visible. Further, it was in one case possible to obtain adduction of the opposite limb when the ankle-reflex was produced by striking the tendo Achillis of either side. This fact and the fact previously noted, that in all cases where the crossed knee-jerk was found it was also reinforceable, appeared to us to be additional reasons for believing that the knee-jerk is a true reflex.

On the other hand, an experiment recently shown by Professor Gotch, of Liverpool, at a recent meeting of the Physiological Society of London, weighs strongly in the opposite direction. In this experiment the lower end of the vastus internus, with its tendon, was freed from all its lower connections and the tendon connected with a lever which recorded on a blackened surface. A piece of metal attached to one wire of an electric circuit, in which a time-marker was introduced, was placed on the patella tendon of the remaining quadriceps group of the same leg, and a blow was delivered on the metal which was in contact with the tendon, by means of another piece of metal connected with the other wire in the circuit, so that the circuit was made at each blow. By these means the exact time that the blow was given was recorded, and also the resulting contraction of the vastus internus. The muscles were so clamped as to put out of mind any possibility of direct drag on the vastus internus by the contraction of the other quadriceps muscles. This experiment demonstrated that the time which elapsed between the delivery of the blow and the resulting contraction was shorter than that required for any of the known reflexes. Further, when the nerve to the vastus internus was directly excited, the time which elapsed between the movement of excitation and the resulting contraction of the muscle was much longer than that which elapsed between the stroke on the remaining quadriceps tendon and the resulting contraction of the freed vastus internus. That the time required for the supposed reflex should be shorter than that occupied by the passage of a current along the nerve to the muscle directly, appears to be strong evidence against the reflex nature of the phenomenon. These facts were very kindly pointed out to us by Mr. J. S. Risien Russell, of London.

One of us, who is consulting physician to two large institutions for feeble-minded children,—that at Elwyn in Pennsylvania and that at Vineland in New Jersey,—made examinations of the children there, testing the knee-jerks of all the inmates who might bear the slightest suspicion of any exaggeration of the phenomenon, with the results described below. Not every individual was so examined, as many are affected only in a purely

mental fashion; but, wherever there was ground for thinking that the motor areas were at fault, this was done. The total number of inmates at Elwyn is nearly a thousand (978) and at Vineland nearly two hundred (197), so that the results are practically conclusive.

At Elwyn sixty-five boys and seventy girls, rated as suffering from the worst motor defects, were carefully explored, with the result that in seventeen cases a contra-lateral adductor reflex measuring from one-eighth to three-quarters of an inch was demonstrated.

Many of them, in whom exaggeration of knee-jerk was suspected, showed little or none; the reinforcements in boys were as usually seen; in girls this reinforcement was far more difficult to get. Again, the proportion of exaggerated knee-jerks in boys was far larger than in girls, though among the general run of cases at a neuropathic dispensary service the exaggeration is much larger in girls than in boys. It would seem that this might be due to a large element of hysteria among girls, and renders it important to repeat the examination more thoroughly in future, which we propose doing and reporting.

One of us (J. M. T.) has now a private patient, long under observation, in whom the lateral jerk is most strikingly seen. This is a lady, forty years of age, who is suffering from an obscure and complicated condition made up of an old trauma (fall) two years ago, repeated attacks of acute rheumatism, and recently much mental worry superadded. Along with this came exceptional strains and inadequate treatment, till, three months since, she became entirely bedridden, with the symptoms of a spastic paraplegia, or possibly a disseminated sclerosis showing a spastic condition of arms and legs, voice tremor, tremulousness and contractures partly spinal and partly rheumatic. A very slight tap on the patella tendon produces violent contractions of both legs, causing the knees to smite together or cross over, also intense pain from thence to occiput; a larger tap will cause, in addition to crossing of the legs, a crossing of both arms in a sort of lock spasm, which subsides but slowly, and usually requires the assistance of a nurse to steady the tremor and stretch out the limbs. Here the lateral jerk involves both knees and elbows. At times the rolling over in bed during sleep will so excite the motor mechanism as to produce an attack. This is the most extreme instance of this phenomenon known to us.

About thirty cases of cerebral atrophies, idiots, hemiplegias, and contractures were examined carefully, and no crossed knee-jerk was found. All cases with the slightest suspicion of exaggerated motor conditions were examined.

It seems fair to assume, since the knee-jerk is reinforced by voluntary movement in any part of the body, that this reinforcement is due to an irradiation of motor impulse from the active centres to other similar centres, so that they and their related muscles acquire a heightened responsiveness to external stimuli. Presuming that the cerebrum is involved in this reflex arc, we may say that the first effect of the tap on the patella tendon is a

centripetal impulse producing activity of a portion of one cortical motor area, this in turn stimulating the corresponding portion of the other hemisphere and producing thereby a contraction of the adductors of the thigh opposite to the one originally struck.

There is, no doubt, a much greater co-ordination and interreaction of similarly situated cerebral and spinal centres than we generally take into consideration. It is a well-known fact that destruction of what is generally called a centre does not always prevent the performance of the function belonging to that centre. The part, however, that muscular tonus plays in the production of knee-jerk is difficult of proof. It sometimes affords a fair explanation of certain peculiar phenomena. Take, for example, the cases recently reported by Kramer.¹ One of these was a case of progressive paralysis complicated by posterior spinal sclerosis, in which after a long absence the knee-jerks had returned. In two similar cases that terminated fatally, careful post-mortem examination failed to disclose any anatomic basis for the unusual phenomenon. In these patients the knee-jerks returned in association with apoplectiform or epileptiform attacks or even spontaneously, remaining present for a long period, at times upon one side, at other times upon the other side, to disappear again or to continue until death took place. The explanation offered is that with the slight amount of muscular tonus ordinarily present the few remaining intact fibres of the posterior columns are unable to complete the reflex, but that with an increase of the muscular tonus, such as occurs in connection with apoplectiform or epileptiform attacks, a tap of the patella tendon is sufficient to induce such stimulation of the anterior horns as to bring about the reflex action.

It is nearly twenty years since this crossed knee-jerk was pointed out by Schultz and Fürbringer. They showed that, by striking the tendon on one side, under certain circumstances the knee-jerk could be elicited not only on that side, but also on the opposite side. They characterized it as reflex, placing the centre in the lower part of the spinal cord.²

Experiments made by Waller and Prevost bear directly on this subject, and were suggested by Tschiriew's investigations on the general subject of the knee-jerk. On dividing the spinal cord at the level of the third lumbar, Tschiriew found that the knee-jerk became exaggerated, but when section was made between the fifth and sixth lumbar roots the knee-jerk disappeared. Successive sections from the sacral region upward failed to destroy the knee-jerk, but on reaching the level of the sixth lumbar pair, taking great pains not to injure the neighboring parts, he found that such section abolished the knee-jerk. Destruction of the segment between the fifth and sixth lumbar pairs accomplished the same result.³

¹ Wiener medizinische Presse, 1894, No. 11, p. 424.

² Centralblatt der medicinische Wissenschaft, 1875, p. 929.

³ Archives de Physiologie, series ii., 1879, vol. vi. p. 293.

Prevost confirmed the above, and stated his belief that the contraction of the opposite quadriceps extensor when the tendon of one side is struck points to the existence of a crossed reflex. To strengthen the view that the phenomenon of knee-jerk is a true reflex, a recent case of Marie¹ may be cited. The subject was a young man believed to have syringomyelia of a pseudo-acromegalic form. The knee-jerk was exaggerated on the right and abolished on the left, as is occasionally observed in syringomyelia, tabes, and general paralysis. Marie made the following note: "If we strike the left patella tendon, no movement of extension is produced, but we see a distinct movement of adduction of the opposite thigh by contraction of the adductors. Now, if the patellar reflex is absent in the patient it is because of an alteration not of the centripetal paths but of the motor centre, although in walking the left limb acts well and we do not notice any atrophy of the femoral triceps." Marie justly believes that in this case the reflex nature of the contraction of the adductors of the right thigh is undeniable, and is not due, as some have maintained, to direct excitation of the muscular fibres under the influence of a shock or jar which is communicated to the fibre by percussion of the tendons. He shows that this contra-lateral contraction of the adductors is observed, moreover, in a great number of healthy subjects in which the knee-jerks are normal. Thus he has corroborated our own work in this regard.

Clinically the crossed knee-jerk may be of value in doubtful cases by enabling us to recognize whether or not the absence of the tendon-jerk is due to alteration of the centripetal paths or whether we are dealing with an affection of the nerve-centres. Accordingly in the case mentioned above the loss of knee-jerk on the left side was due not to any defect in the centripetal nerves of that side, but to a central, probably spinal, lesion, which, however, was incompetent to abolish the knee-jerk upon the right side.

Prevost and Waller went further. They divided the sciatic, anterior crural, and posterior roots on one side, and yet did not abolish the crossed movement. Percussion of the tendon on the injured side caused no contraction on that side, but evoked a contraction on the opposite side, at least as vigorous as before the injury. The apparent conclusion was that there was no physiological transmission, and therefore no "crossed reflex," but that the result was due to "physiological diffusion of vibrations."²

The same authors in 1881³ made a more complete exposition of this subject. They here state that the movement transmitted in the opposite limb by percussion of the patella tendon is a movement similar to that developed in the member struck. It is not an isolated contraction of the rectus muscle of the thigh; they recognize that the movement in the opposite limb is chiefly adduction and extension. When by section of the crural

¹ L'Union Médicale, April 17, 1894.

² Archiv für Anatomie und Physiologie, Abth. 1880, Heft 3.

³ Revue Médicale de la Suisse Romande.

nerve and sciatic we destroy in a rabbit the nerve-supply of one of the hind legs, or, better still, when we cut the posterior roots of the fifth, sixth, and seventh lumbar pairs and first sacral (the origin of the nerves going to the hind limb), we note, in percussing the tendon of the limb that has been operated upon, that the knee-jerk has disappeared on that side, but that the movement transmitted to the other side persists as before section of the nerves or posterior roots, without being diminished in force.

Further, when we compress the abdominal aorta we see the movement which is produced in the healthy leg (opposite to that on which the tendon is cut) first exaggerated and then disappear. When we cease compression of the aorta, continuing percussion of the enervated leg, we soon see the above-mentioned movement reappear in the opposite member, without its occurrence in the member struck, the nerves of which have been cut. These investigators infer, therefore, that the integrity of the spinal cord is necessary for the production of the transmitted movement in the opposite limb as well as for the knee-jerk of the struck limb; they infer also that it is not a true reflex, on account of the destruction of the reflex arc by section of the nerves or posterior roots, and conclude that the production of this movement of the muscles or tendons is due to vibrations of percussion which are transmitted to them.

PREVOST AND WALLER'S EXPERIMENTS.

Experiment I. Rabbit.—Section of the nerves does not inhibit the transmission of a movement in the opposite limb on percussion of the patella tendon. (In this case, however, the branches of the sciatic distributed to the adductor muscles escaped being cut.)

Experiment II. Rabbit.—After section of the right sciatic and crural, percussion of the right patella tendon produced a movement of the left limb as before operation. (The nerves were found well cut.)

Experiment III. Rabbit.—Percussion of the right patella tendon produces, in spite of section of the sciatic and crural of the right side, a movement in the opposite member. (Here it was found that a branch of the sciatic to the superior muscles of the thigh were not cut.)

These three experiments are not, however, conclusive. The movement in the opposite member occurred, but section of the sciatic nerve was not complete, a branch having escaped in two of the sections. Prevost and Waller inquire whether there may not be some action on nerves having another origin than the sciatic and crural,—e.g., the obturator nerve (this nerve supplies the obturator externus, the adductor muscles of the thigh, and occasionally the integument of the thigh and leg), or the external cutaneous nerve (this supplies the skin). The latter nerve arises from the second lumbar while the former arises from the third and fourth lumbar nerves. Is it possible that these are able to be excited by percussion of the patella tendon, and call out a movement of a reflex nature in the opposite thigh?

These investigators determined to make a radical operation, and we give the experiment in detail.

Experiment IV. Medium-Sized Rabbit.—Section of the posterior roots of the nerves of the *left* hind limb and section of the nerves themselves. Percussion of the left patella tendon produces a movement of the *right* member, as before the operation. Compression of the abdominal aorta abolishes the phenomenon.

The rabbit was etherized and the lumbo-dorsal cord divided; also the posterior roots of the fifth, sixth, and seventh lumbar pairs and the first sacral on the left side. Percussion of the left patella tendon does not produce the knee-jerk on that side, but it produces a well-marked movement in the right lower limb (opposite side). This movement has altogether the character of extension and of adduction; at times it partakes of the character of clonus. The phenomenon ceases on compression of the abdominal aorta; it becomes stronger at the beginning of compression of the aorta and some moments after cessation of that compression and during the rush in which the circulation is re-established. On the right side the knee-jerk is well marked. We then cut on the left side the sciatic, crural, and obturator nerves, and the external cutaneous branch, in order to destroy all centripetal innervation in the case where a posterior root might have escaped section. The phenomenon of transmission of movement in the right hind limb following percussion of left patella tendon is produced as before and with the same intensity. This percussion does not produce movement in the left leg which is struck.

After death of the animal all the posterior roots of the fifth, sixth, and seventh lumbar pairs were found to have been cut. The anterior roots and the cord were not injured in the operation.¹

The knee-jerk is shown by Sherrington² to be usually mainly dependent on the integrity of the root of the fifth lumbar nerve; occasionally, however, it is as largely dependent on the fourth as on the fifth. These observations are based on experiments with the frog, rabbit, cat, *Macacus rhesus* and Bonnet monkeys, accompanied with dissections. This location corresponds in man to the third and fourth lumbar segments of the cord.

Notwithstanding evidence of this nature, there is reason to believe that the reflex arc included the brain as well as the spinal cord. This view is borne out by the occasional observation in hysterical cases that the tap on the patella tendon produces movement at a distant point;—*e.g.*, in the arms. An excellent illustration of this we have detailed above,—*viz.*, in the case in which a tap of the patella tendon produces violent crossing of the arms as well as of the lower limbs.

¹ *Revue Médicale de la Suisse Romande*, 1881.

² *Journal of Physiology*, 1892, p. 756.

REVIEW OF MEDICINE.

MEDICINE.

IN CHARGE OF JOHN H. MUSSER, M.D.,

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AND

J. A. SCOTT, A.M., M.D.,

Physician to the Out-Patient Department of the Pennsylvania Hospital; Assistant Demonstrator of Morbid Anatomy in the University of Pennsylvania.

On Cycling as a Cause of Heart-Disease. (*Lancet*, March 2, 1895.)
By George Herschell, M.D. (Lond.), of London.

The chief danger of cycling lies in the fact that a cyclist takes much more exercise than he is aware of or than he intends to, and is frequently tempted to overtax his powers. This overtaxing of strength may accompany efforts to reach a given point as laid down in plans for the day, or as is made necessary by certain exigencies. More frequently, however, the extra exertion is put forth in hill-climbing. In this latter case the heart has already as much strain put upon it as it can stand with impunity; but a glance shows the rider that but a few more turns of the wheel will bring him to the top, and he redoubles his exertions, and the mischief is done. In club runs, again, while the start is made to correspond with the pace of the slowest riders, the faster riders unconsciously quicken their pace, and the slower ones must follow at a rate entirely beyond their capacity or be left behind. Riding with a high gear is a further source of overtaxing the strength. Excessive cycling, by the strain thrown upon the heart, may produce one of four conditions: first, simple hypertrophy. This is a compensatory effort on the part of nature to enable the work to be performed, and may terminate in recovery, in valvular disease and disease of the aorta, or in degeneration of the heart muscle. The latter condition is the common fate of an hypertrophied muscle. Second, acute dilatation of the heart. This condition begins as soon as the cyclist shows signs of being "short of breath." Until this time the blood pumped into the lungs and that pumped out into the tissues is equal in amount; but as soon as this symptom appears there is an inequality in the delivery from the two ventricles, and, if exertion is then continued, permanent damage will result. This condition may terminate in recovery, in the production of valvular disease, or in sudden death. Third, chronic valvular disease of the heart. This trouble may arise as a sequel to acute dilatation of the heart on account

of the stretching of the auriculo-ventricular ring. It may arise as a result of hypertrophy from stretching of the aortic ring, from the giving way of a valve, or from the occurrence of sclerotic changes in the valves. Fourth, functional derangement of the heart. This condition is very frequent as a result of cycling, and is comparable to the cases of irritable heart described by Da Costa as occurring among the soldiers during the Civil War. It would seem as though the strain thrown upon the heart had caused a suspension of the inhibitory function of the pneumogastric nerve. The symptoms commonly noted were palpitation, dyspnœa, a sensation of sinking at the epigastrium, subjective sensations in the region of the heart, intermittency of the heart's action, and anginoid symptoms. While the above enumerated dangers are constantly present to the cyclist, yet in moderation and under proper conditions, it is one of the most health-giving forms of exercise and is a potent remedial measure in established heart-disease. As preventive measures against the dangers of this fascinating sport may be mentioned: first, the use of a low gear; second, the upright position in riding; third, adequate food when riding and the avoidance of muscle poisons, such as beef tea; fourth, the avoidance of preparations of kola and coca, which numb the sense of weariness; and fifth, on no account should the cyclist continue riding after he has commenced to feel short of breath, or when there is the slightest sense of weariness in the chest.

Some Experiences in the Production and Use of Diphtheria Antitoxin. (*Medical Record*, April 20, 1895.) By Hermann M. Biggs, M.D., of New York.

The cases of diphtheria treated with antitoxin under the supervision of the Health Department comprises two series: first, those treated in the Willard Parker Hospital, and second, those treated among the poor outside the hospital. In the first series there were one hundred and sixty-four cases treated, with forty-five deaths, a percentage mortality of 27.4. In the second series there were two hundred and fifty-five cases treated, with forty deaths, a percentage mortality of 15.69. Of the forty deaths in this series, fifteen took place in less than twelve hours after the serum was administered, and were noted in cases moribund before the administration of the remedy. The cases treated in the hospital were more severe, came under observation later in the course of the disease, and were more frequently suffering from serious complications than those treated outside the hospital. In eighty-two cases of true diphtheria treated, thirty-three remained absolutely free from any annoying after-effects from the antitoxin. Of the remaining cases twenty-two developed urticaria and eight developed an erythema more or less confined to the locality of the injection. There was one case of general urticaria followed by neuralgic pains in the limbs accompanied by loss of power and swelling, stiffness, and hyperæsthesia of the joints. These symptoms were also observed in five cases of false diphtheria, injected while awaiting the result of the culture. In fatal cases treated by

the antitoxin no new anatomical lesions have been found. There is no positive evidence as yet to show that antitoxin has produced or hastened death, although, in rare instances, it may produce serious complications. There were twenty-one cases of albuminuria in one hundred and twenty-nine cases treated; two of which died from suppression of the urine. Six cases presented slight paralysis. The new remedy is a specific against diphtheria toxæmia only; it increases cell resistance, reduces inflammatory swelling, and arrests extension of the membrane. To be effective it must be administered early in the course of the disease, before complications have occurred or the effects of the diphtheria toxin have been produced on the tissues. The earlier the antitoxin is administered, the more striking are the results produced and the more certain the cure.

Auscultatory Percussion and allied Methods of Physical Diagnosis. (*Medical and Surgical Reporter*, April 27, 1895.) By A. L. Benedict, A.M., M.D., of Buffalo, N. Y.

This method of mapping out the solid and hollow viscera of the economy is recommended because of its extreme accuracy. By its aid the diagnostician is able to draw the line of separation between the two lungs as closely as nature herself, even where the mediastinal space does not widen out. The whole cardiac area may be accurately mapped out and a dilatation of the right side of the heart can be detected as easily as an enlargement of the left ventricle. Alterations in the size of the spleen, liver, and stomach are easily distinguished and much valuable aid to diagnosis is thus given. The colon can easily be differentiated from the stomach and small intestine, and the examination of various tumors of the pelvic organs is facilitated. A pleximeter is not necessary, the finger, tapping upon the bare skin, being sufficient to produce the sounds. The vibrations may be made by frictions, by the tuning-fork, or by a portable faradic coil.

The Blood in the Insane. (*American Journal of Insanity*, April, 1895.) By James Burton, M.D., of Ogdensburg, N. Y.

Cover-glass preparations of the blood were examined from three cases of senile dementia, four of general paralysis, one of Graves's disease, one of chronic mania, one of katatonia, one of acute mania, two of stuporous melancholia, and one of acute melancholia. The preparations were stained with Ehrlich's triple stain, after being fixed by heat. There was an increase in the number of leucocytes in two cases of senile dementia, in the three melancholia cases, in both cases of mania, in the case of Graves's disease, and in one case of general paralysis. The highest number of leucocytes present in one case was twenty-two thousand, in the case of acute mania. The number of leucocytes was diminished in the case of katatonia, in one of the cases of senile dementia, and in three of the cases of general paralysis. The lowest number in one case was seven thousand, in one of the cases of senile dementia. In the cases with a tendency to maniacal excitement the number

of leucocytes was greatly increased. The red corpuscles were counted and the hæmoglobin estimated in all cases which were not too violent. The red cells were not markedly reduced in any of the cases, and the hæmoglobin was never below sixty-five per cent. In the case of acute mania the red corpuscles were 7,730,000 and the hæmoglobin one hundred and five per cent.

A Case of Idiopathic Rupture of the Heart. (*Lancet*, April 20, 1895.) By Dudley W. Collings, M.B., of Tottenham Hospital.

A man, aged fifty-three years, was admitted to the Tottenham Hospital with left-sided hemiplegia. The tongue was deviated to the right, on protrusion; the sphincters were unaffected. The heart-sounds were faint, but there were no added sounds. The attack began with severe pain in the præcordium, followed by the hemiplegia. The history of the case was negative. On the day after admission, as the patient was being lifted on to the bed-pan, he died almost instantly. At autopsy the pericardium was found filled with blood-clot, and a laceration about one and a half inches in length was seen in the lateral wall of the left ventricle. The heart muscle was in an advanced stage of fatty degeneration; there was no valvular lesion. No microscopic changes were observed in the brain, its vessels, or the meninges.

A Case of Casual Cow-Pox in Man. (*British Medical Journal*, April 27, 1895.) By C. E. Reading Bucknill, L.S.A. (Lond.).

The patient was a milkman, aged twenty-four, and presented a vesicle and two papules on the flexor surface of the left forearm which had made their appearance on three consecutive days. There was some tenderness and enlargement of the axillary glands and slight constitutional disturbance on the first examination. On the ninth day after exposure, and on the seventh day after the eruption of the first papule, the three pocks presented a typical appearance. This fact illustrates the law that successive inoculations with vaccine lymph upon different days in the same subject produce mature vesicles on the same day. The source of the infection was traced to one of the cows which the patient was in the habit of milking. This animal presented numerous button-like crusts, some of which were umbilicated, on the teats, chiefly on the two anterior ones. That the disease was genuine cow-pox was proven by the fact that the patient was revaccinated in four places with reliable calf lymph, none of the inoculations being successful. The cow had recently been purchased by the farmer and her history could not be traced.

THERAPEUTICS.

IN CHARGE OF ALEXANDER D. BLACKADER, B.A., M.D.,

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ASSISTED BY

D. J. EVANS, M.D.

On the Employment of Asaprol in the Treatment of Sydenham's Chorea. (*Revue des Maladies de l'Enfance*, May, 1895.) By Dr. Moncor.

The writer states that he has in several cases tried this new drug, a soluble derivative of beta-naphthol, introduced by Dujardin-Beaumetz as an antiseptic, antipyretic, and nerve sedative, and has found it of service in the treatment of malarial poisoning and of whooping-cough. Very lately he met with a case of chorea, associated with malarial poisoning, in which he also made trial of its action. The full notes of the case are given: a boy, aged eleven years, and presenting symptoms of both rachitis and congenital syphilis, in whom, during the course of an attack of malaria, severe choreic symptoms made their appearance. Asaprol, given in daily doses, at first of one gramme, but gradually increased to five grammes, seems to have had a most satisfactory action. The drug, it is stated, produced no unpleasant by-effects; the malarial symptoms promptly disappeared, and the chorea was cured in about seven weeks. During the administration of the drug the lad's mental condition improved, his muscular power more than doubled, and he gained very considerably in weight. Dr. Moncor strongly recommends further trials of this remedy.

Treatment of Typhoid Fever with Typhoid Thymus Extract. (*New York Medical Journal*, April 27, 1895.) By Alexander Lambert, M.D.

The writer, referring to the report of Fraenkel on his treatment of fifty-seven cases of typhoid fever by deep subcutaneous injections of a thymus bouillon in which the typhoid bacillus had been grown and then killed, says that he considered that the results obtained were so striking that he determined to test for himself its therapeutic value. The thymus bouillon was prepared according to the method of Brieger and Kitasato, and was then inoculated from a broth culture of the bacillus obtained fresh from the spleen of a patient who had died from typhoid fever. The culture was allowed to grow in a thermostat for seventy-two hours and was then sterilized. Twenty-eight cases were treated. Of these, fifteen in whom the injections were commenced from the sixth to the fifteenth day, averaging the tenth day, showed marked improvement. The injections were made deep in the gluteal region on alternating sides. In only one case was there any local reaction. As a rule, after the third injection, the temperature curve showed a lower range, and after the fifth, there was a decided

fall of several degrees. The pulse showed distinct improvement, both in frequency and in force, while the general condition was much improved. In twelve cases in which the injections were commenced on an average five days later than the above, no distinct benefit was observed, but, at the same time, no harmful effect was noticeable. In the one fatal case the disease ran a very severe course. The injections were begun when the patient was in an extremely poor general condition. Cold baths were also given. The patient died on the fifteenth day. In summing up his results, Dr. Lambert concludes that, while he did not obtain the brilliant results of Fraenkel and Rumpf, in a little more than half of his cases the extract undoubtedly modified the severity of the disease.

The Treatment of Metrorrhagia. (*La Presse Médicale*, March 9, 1895.) By M. Labadie-Lagran.

The writer, after remarking on the persistent character of many uterine hemorrhages, and that even curetting the endometrium occasionally fails to relieve it, speaks of the excellent results that he has had from the topical application of a mixture of antipyrin and salol. Salol was specially selected on account of its liquefaction at a low temperature. The mixture is easily prepared by filling a test-tube one-third full of a mixture of antipyrin and salol in equal proportions, and applying heat. Fusion takes place in two or three minutes, and a slightly brownish liquid is obtained. To render the mixture less liable to solidify, it is recommended to continue the action of the heat until the mixture becomes of a distinctly brown color, when the product will remain liquid for a sufficient length of time. This is gently applied by means of a tampon of absorbent cotton to the entire surface of the endometrium. The application is not at all painful. A tampon of cotton with glycerin is left in the vagina, and the patient kept in bed. Hemorrhage is immediately arrested, and it is rare to have to make a second application.

Salipyrin in Menorrhagia and Metrorrhagia. (*Berliner klinische Wochenschrift*, 1895, No. 7. *Lancet*, April 20, 1895.) By E. G. Orthmann.

The writer has tested the value of salipyrin in the various forms of uterine hemorrhage by observations on thirty-two patients in Dr. Martin's clinic in Berlin. Fourteen of these cases were purely functional. In three the metrorrhagia was associated with salpingitis and oöphoritis, while the remaining fifteen were classed under the head of endometritis hemorrhagica. Of the thirty-two cases twenty were more or less beneficially influenced, the most marked success being obtained in simple menorrhagia subsequent to parturition or abortion. In no instance were any unpleasant by-effects noticed. The salipyrin was given in the form of lozenges containing fifteen grains each. Of these the patients took three daily, commencing a day or two before the hemorrhage was expected and continuing throughout the

whole period. Dr. Orthmann considers that the results obtained warrant his recommending the trial of this drug in suitable cases of uterine hemorrhage.

Hot Baths in Cerebro-Spinal Meningitis. (*Therap. Monatsheft*, February, 1895.) By I. Woroschilsky.

The writer treated two cases of this affection, following the method advocated by Aufrecht, and obtained very satisfactory results. The first patient had been ill for eight days, when the first bath was administered. Calm sleep followed, and on the following day the patient felt easier. After eight daily baths the patient was practically cured, and has now completely recovered. The second case, although severe in character, under similar treatment also made a good recovery. The temperature of the baths throughout was 104° F. and the patient was immersed for ten minutes. Their apparent effect was to induce sleep, diminish the headache, lower the temperature, and improve the pulse.

On the Employment of Antistreptococcic Serum. (*La Presse Médicale*, April 6, 1895.)

At the meeting of the *Société de Biologie*, Dr. Roger related his experience in the treatment of some cases of puerperal fever and erysipelas by the injection of this serum. He referred to a previous case, which, although severe, had been cured in forty-eight hours, the particulars of which he had given at a former meeting. The next case was that of a puerperal woman, in whom symptoms of septicæmia set in on the evening of the fourth day. Under daily injections for four days the temperature became normal, and the general conditions excellent. In another instance a weakly infant aged three weeks, and weighing at birth only five and a half pounds, was attacked by erysipelas. Forty-eight hours after the appearance of the rash on the face five cubic centimetres of the serum were injected under the skin. A cure resulted in four days and the infant rapidly gained weight. In another case a severe tonsillitis with high temperature, and feeble, rapid pulse, yielded rapidly to injections of thirty cubic centimetres repeated twice daily. Although the cases are too few to warrant our drawing conclusions as to the positive curative action of the serum, they demonstrate its harmlessness, and encourage further trials of the remedy.

The Treatment of Morning Diarrhœa. (*Medical Record*, May 11, 1895.) By Francis Delafield, M. D.

Under the term of morning diarrhœa, the writer designates a group of cases in which there is a tendency to one or two loose movements of the bowels during the early morning hours. The pathology and etiology appear obscure. In some cases there may be no disturbance of the general health. In others, the exhaustion is so great that attention to business or work is impossible. Those cases in which we meet with considerable mucus

in the discharges are the most unyielding to treatment. His recommendations for treatment are change of climate, especially a prolonged residence in a dry inland climate, a careful dietary, and occasionally lavage of the stomach. In the matter of drugs, opium, he says, effects no permanent improvement. His results from the use of the subnitrate and the subgallate of bismuth and of beta-naphthol bismuth have not been satisfactory. Salol and naphthalin answer well in a few cases, but have absolutely no effect in others. Arsenic, quinine, ipecac, belladonna, and cannabis are occasionally useful, but the drug which has given him the best results is castor oil in doses of five to ten drops.

The Treatment of Goitre by the Thyroid Diet. (*Beiträge zur klinische Chirurgie*, vol. xii., No. 3.) By Dr. Bruns.

The researches conducted by this author in the treatment of goitre by means of a diet of fresh thyroid gland have shown that in the treatment of these diseases, as well as in those dependent upon a decreased functional activity in the thyroid, this diet has a specification which shows itself in the rapid decrease in size of the goitre or its total disappearance.

The studies carried on by this author in sixty cases have caused him to limit the cases in which this treatment is effective, and also to limit its mode of action. The exceptions to its action are cases of cystic goitre and malignant forms, while in that known as exophthalmic goitre it has but slight action.

The dose for adults is two and a half drachms of the fresh gland in eight days, while in children the dose was seventy-five grains in eight days. Larger doses produced the symptoms of poisoning so often described. Thyroid tablets were used in a dose of two per day for an adult and one for children. Any result possible to be attained can only be reached by the use of small doses.

Of his sixty cases, fourteen were completely cured, twenty were freed from symptoms but not entirely from the goitre, nine were improved mentally, while seventeen received no benefit from the treatment. The action of the treatment was manifest in eight days after using the gland. The usefulness of the incomplete cures is seen in the absence of distressing symptoms, especially the difficulty in breathing.

A further use of the treatment is seen in the greater facility with which the remaining portions of the gland can be removed by operation, as they are smaller, more movable, and lie in loose connective tissue. Only the hypertrophic forms of goitre are amenable to this method of treatment, the degenerative forms (cystic, colloid, and fibrous) remaining unaffected. The treatment is therefore of more benefit in young patients, and the earlier it is begun the better.

The limitation of the treatment to the hypertrophic form would tend to show that this hypertrophy is perhaps caused by a greater demand of the system, and the treatment is therefore a compensatory or substitutional one.

SURGERY.

IN CHARGE OF HENRY R. WHARTON, M.D.,

Demonstrator of Surgery and Lecturer on Surgical Diseases of Children in the University of Pennsylvania; Surgeon to the Presbyterian Hospital, the Methodist Episcopal Hospital, and the Children's Hospital; Consulting Surgeon to the Presbyterian Orphanage,

AND

JOSEPH P. TUNIS, A.B., M.D.,

Assistant Demonstrator of Surgery in the University of Pennsylvania; Surgeon to the Dispensaries of the Presbyterian, Methodist Episcopal, and Children's Hospitals.

Penetrating Wounds of the Chest. (*Revue de Chirurgie*, January, 1895.) By Huget and Péraire.

After a thorough discussion of this question, and a number of interesting cases, these authors come to the following conclusions:

1. That it is absolutely necessary in these cases to treat the patients at the time and in the place where the accident occurred without waiting to carry them to a hospital. The jolting and movements inevitable during transportation are very liable to produce a hæmoptysis, or increase one already present, and so cause death.

2. The tendency to syncope should be respected, as it favors hæmostasis. Consequently, subcutaneous injections of ether should rarely be given unless the depression is marked. The injection to be preferred in these cases is of caffeine or of artificial serum.

3. The treatment of these wounds by ordinary means is useless in the majority of cases unless the patient is put absolutely at rest. The most perfect repose is secured by immobilizing the thorax by means of adhesive plaster and a well-applied bandage.

4. This method of treatment does not, of course, preclude the use of antiseptic treatment of the wound, with ligation of arteries, suturing of the wound, and the use of compressive and occlusive antiseptic dressings.

5. In case a hæmothorax arises from the injury of a large vessel the treatment should be one of "aimed expectation," and is entirely dependent upon the conditions present. Symptoms and complications are the guides of treatment. Thoracocentesis should not be practised unless the extravasation of blood is very large and death from dyspnœa is threatened.

6. In these cases the toilet of the person, after the wound has been dressed, should be avoided.

The Aseptic Treatment of Suppurating Wounds. (*Centralblatt für Chirurgie*, No. 14.) By H. Zeidler, of St. Petersburg.

The tendency of modern surgery towards aseptic methods is no more strongly marked than in this article. The author, basing his deductions on experimental research backed up by clinical study, shows forcibly the advance that is being made in surgery by the study of bacteriology in connection with the processes which call for the aid of the surgeon. Although the idea is not an original one with this author, his study places the ques-

tion upon a firmer foundation, and makes his argument in favor of aseptic treatment a very strong one.

The following method is the one which he has, as a rule, employed for the past year with good results in his hospital. After the ordinary preparation of the area of operations and the performance of the operation under aseptic precautions, the suppurating surface of the wound is wiped dry with sterilized gauze, and the wound is packed with sterile gauze, firmly but not too tightly. In some cases irrigation may be deemed necessary, but they are rare: where irrigation is needed he advises the use of a six-per-cent. salt solution. The external dressing should be sterile and capable of absorbing the secretions from the wound. In some cases a moist dressing may be advantageous, and then the author advises the use of a salt solution to moisten the gauze. The author believes that the moisture is the essential part in wet dressing and not the antiseptic in solution. Iodoform gauze he reserves for tubercular diseases and foul wounds. The use of iodoform in other cases is not clear to this author. He has never seen any decomposition in secretions that have been eight days in a wound in which sterile gauze has been used. An absorptive dressing is necessary, however, to produce this result.

The local effect upon the wound is pleasing, the secretion is much less in amount, granulations spring up normally, are not hypertrophic, and do not bleed easily as is frequently the case where antiseptics are employed. The dressings are not as frequent as once in eight days, and strong odor or decomposition is never noticeable. As long as the drainage is perfect, the reaction is much less than in wounds treated antiseptically.

The essential factor in the treatment of suppuration is free opening and free drainage. Disinfection is not only useless, but is dangerous.

Internal Choledochoduodenostomy for Impacted Gall-Stone; Recovery. (*Correspondenzblatt für Sch. Aerzte*, No. 7, xxv., 1895.) By Professor Theodore Kocher, of Bern.

This author, in dealing with this subject, says that there are many instances in which impacted gall-stones can neither be crushed nor pushed one way or the other out of the choledochus, and in which the versatility of the operator is strongly taxed. As an illustration he relates the following case and the method which he pursued.

After the incision had been made and the liver pushed up, the gall-bladder was found to be small, and containing no stones and very little bile. The displacement of some knuckles of intestine disclosed the duodenum, and by passing a finger behind it a stone the size of a pigeon's egg was found impacted in the ductus choledochus. It was impossible to crush it with forceps or to dislodge it. The duodenum was so tightly bound down by adhesions that an attempt to displace it and attack the stone directly was followed by hemorrhage. It was therefore necessary to attack it through the duodenum. The operator passed his finger behind the stone

and pressed it forward with the duodenum, an assistant held the duodenum upon the stone, while a transverse incision was made through the anterior wall including its entire breadth. A longitudinal incision was then made from within outward through the posterior wall upon the stone, including the wall of the ductus choledochus. Through this incision the stone was removed, and the wall of the choledochus sewn to the wall of the duodenum, forming a fistula between the two. The anterior wound in the intestine was then closed; a drainage-tube and gauze packing placed on either side of the duodenum, and the wound allowed to heal by granulation. The patient made a complete recovery.

The Treatment of Idiocy and Microcephalism by Lannelogue's Operation. (*Prager Medicinische Wochenschrift*, pp. 39-45, 1894.) By C. Beck, M.D.

In dealing with this subject the author formulates the etiological factors and extent of microcephalism as follows:

1. Microcephalism is an agnesia of the central nervous system.
2. The alterations which take place in the bony structures (decrease in size and early ossification of the bones) are the results of the cerebral agnesia.
3. Frequently there is present an accompanying decrease in the size of the spinal canal (micromyelia).
4. The agnesia may originate at any period of the embryonal development.
5. Pathological changes may be present at the same time with this lack of development.

According to these factors the condition is one dependent upon a central nervous defect, and the operation proposed does not deal with the cause but with its effect, and we would consequently expect it to be of little value. The results shown by the author, however, as recorded in the cases which he has collected from the literature of the subject and two of his own cases, lead to a different conclusion, and he endeavors to formulate strict indications for this operation.

Resection of the Colon for Carcinoma, with Recovery. (*Berliner klinische Wochenschrift*, February 4, 1895.) By J. Israel.

A woman, eighty-four years of age, entered the hospital for chronic intestinal obstruction of long duration, apparently due to a tumor. An artificial anus was made in the left groin, but the seat of obstruction was not discovered until an extensive intussusception took place, the bowel prolapsed at the artificial anus and revealed the suspected carcinoma. The portion of bowel containing the tumor was removed and was found to be transverse colon. The artificial anus, which was supposed to have been made in the sigmoid flexure, was in the transverse colon. The distended colon had been displaced behind and below the left flexure, making an

acute angle in the left inguinal region, and then passed upward in front of the sigmoid flexure. Sixteen and one-half months later the patient died of pneumonia. At the autopsy a linear scar was found in the transverse colon, showing the point of resection. There was no stricture, and the intestine, mesentery, and glands were free from carcinomatous growth.

Twelve Hundred and Thirty-one Recent Cases of Sprain treated by Massage. (*Medical News*, April 30, 1895.) By A. Ernest Gallant, M.D., of New York.

These cases, which include every variety and degree of sprain, were treated under the direction of Professor Van Arsdale in the Good Samaritan and Eastern Dispensaries. The best and quickest results were obtained by beginning massage immediately after injury, but neglected cases and those treated previously by immobilization will respond and give satisfactory results. His method for applying massage to a sprained ankle is as follows: The patient is placed either upon his back at full length on a low table with his head on a pillow, or upon the abdomen, with the flexors of the legs relaxed. The entire foot and leg are then moistened with a mixture of equal parts of ol. hyoseyami coct. (Ph. G.) and pure chloroform. Beginning well above the swollen portions of the limb, gentle systematic upward strokes are carried above the knee. Both hands are held parallel with the sides of the legs, the pulp of the fingers being used for the first strokes, then the palmar surface is brought in contact with the skin, and long, slow strokes, which include the whole circumference of the leg, are made, the force of the pressure being increased until it is finally necessary to grasp the heel and make counter-traction in order to steady the limb. When the leg shows evidence of depletion of venous blood and lymph, the strokes may begin lower down and more directly over the seat of injury. Whenever the superficial veins that were first emptied appear engorged, the massage of the upper leg must be repeated in order to evacuate the newly-imported supply of blood and lymph well into the vessels of the thigh. The regions of hardness, stiffness, and soreness are sought out and made the special points of attack. Finally, the strokes are gradually made more gentle again, and, becoming longer, extend from the foot well up to the knee. When the séance is ended the patient should be entirely free from pain.

Massage of the limb should be made twice daily, morning and afternoon, for half an hour at a time. After massage rest the joint for half an hour, and then permit the use of the limb in walking. The only contraindications mentioned are that massage should never be applied in bacterial inflammations,—i.e., tuberculous, gonorrhœal, or pyæmic joints.

The author concludes that massage of sprained joints will—1. Prevent swelling, or rapidly disperse it if present. 2. Prevent pain, or quickly remove it when due, as it must be, to tension. 3. Prevent stiffness, or overcome it when already present from disuse. 4. Prevent the sense of weak-

ness and restore the part to its original vigor and strength. 5. Reduce the time of treatment from *weeks* to a corresponding number of *days*. 6. Permit the immediate use of the injured member.

The Treatment of Tuberculous Disease of the Bones and Joints. (*Von Langenbeck's Archiv*, vol. xlix., No. 1.) By Neuber, of Kiel.

This author reports fifteen cases of these forms of tuberculosis in which he obtained fourteen complete recoveries, and one case is still under treatment. In eight he obtained primary union, in four secondary, and in two a slight amount of suppuration.

The author believes that formal resection should be superseded by careful removal of all the diseased bone and tissues, and he lays especial stress upon the use of a ten-per-cent. emulsion of iodoform in glycerin and of a light iodoform dressing.

This author believes that the various conservative methods of treatment are of little value, and that early operation should be employed in all cases. The author also advocates the use of a five-per-cent. emulsion of iodoform in glycerin in the treatment of all wounds, since it displaces the air present in the wound. He does not employ drainage-tubes, but depends on pressure to produce the desired results.

GENITO-URINARY SURGERY.

IN CHARGE OF WILLIAM K. OTIS, M.D.,

New York.

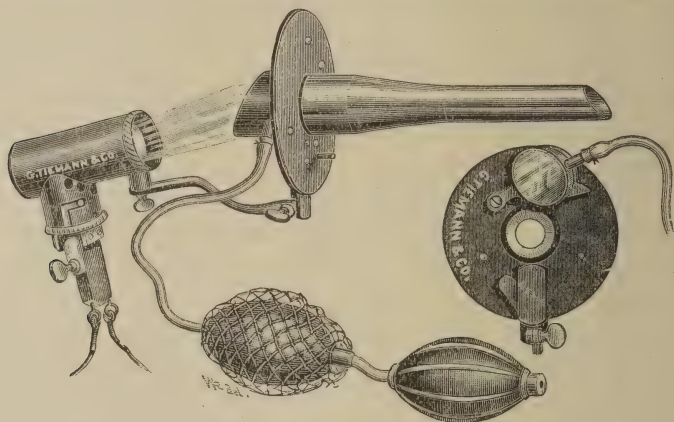
A New Form of Aëro-Urethroscope. (Eine neue Form des Aëro-urethroskops. *Centralblatt für die Krankheiten der Harn- und Sexualorgane*, vol. vi., No. 3, April, 1895.) By William K. Otis, M.D.

The advantages to be derived from an ocular inspection of the inflated urethra are at times indispensable to a thorough appreciation of the pathological conditions present and hence to the most logical and consistent form of treatment. While, perhaps, this comparatively recent method of urethral examination will never entirely supersede the older forms of urethroscopy, it certainly presents an additional means of investigation in the complicated and obscure conditions which so often exist in diseases of the male urethra.

Sufficient time and experience have already been accorded this method to demonstrate its real utility, while the simplicity of the instrument here presented removes all technical difficulties of examination.

This consists of a hard rubber disk one and three-fourths inches in diameter and one-sixteenth inch in thickness, backed with metal. In the centre of this disk is a circular aperture one-half inch in diameter, to the inferior edge of which is soldered a metal rim one-fourth inch in depth, forming the male half of a sliding joint by which the different sizes of urethral

tubes are attached to the instrument. On the superior surface of the disk a glass diaphragm, held in a metal collar and placed at an oblique angle to prevent the reflection of light, is arranged on a pivot so as to swing over the aperture, hermetically closing it; or, when desired, instrumental appli-



W. K. Otis's Aëro-Urethroscope.

cations through the tube beneath may be made *by simply swinging it in the opposite direction*. A slight projection on the side of the cap locks under the outer end of the metal shoulder, by means of which the illuminator is fastened to the plate, in exactly the same manner as it is to the Klotz tube. A small metal tube extends from the edge of the plate into the movable cap. To the outer end of this tube is fastened a piece of rubber tubing with double India-rubber bulbs, like those used in the Paquelin cautery, by means of which the urethra is inflated. Urethral tubes of any length or calibre may be used with this instrument. To prevent the escape of air from the urethra the proximal ends of the urethral tubes are made conical so that they may be firmly wedged into the meatus urinarius, though if a metal cap covering the glans penis is preferred for this purpose, tubes of that pattern may be adopted.

The advantages of this instrument over others designed for a similar purpose are:

1. Ready access to the urethral field for the purpose of making local applications under the direct control of the light.
2. Minimum distance between the eye and the urethral mucous membrane, hence a better and clearer view of the field.
3. Extreme lightness, the importance of which is obvious.
4. Simplicity of construction and moderate cost.

Ichthyol in the Treatment of Urethritis and Cystitis. (L'Ichthyol dans le Traitement des Urethrites et des Cystites.) By Dr. Roberto Villetti, of Rome.

This author considers that in gonorrhœal urethritis, injections of an aqueous solution of ichthyol are extremely efficacious, bringing in contact

with the urethral mucous membrane a medicament which rapidly destroys the specific germ of the disease (gonococcus Neisser). In addition to its bactericidal action ichthyol has antiphlogistic and resolvent properties and does not produce or predispose to urethral stricture. On account of its antiphlogistic action, ichthyol does not produce pain, but, on the contrary, is soothing and reduces the discomforts of nocturnal erections and of micturition.

In vesical catarrh, washing with watery solutions of ichthyol soothes the pain, stops the activity of pathogenic germs, and kills the microbes which hinder the cure of the malady by producing intravesical ammoniacal fermentation and consecutive ammonæmia. In gonorrhœa Dr. Villetti injects by means of an ordinary syringe a two-per-cent. watery solution of ichthyol five or six times daily, and gradually increases the strength of the solution up to five per cent., corresponding to the tolerance of the urethral mucous membrane. With the amelioration of the disease the number of injections are diminished to one in the morning and one at night, which are continued for eight days after the complete disappearance of the discharge. In the more rebellious cases and in those which have become chronic before commencing treatment the washings should continue for twenty-five days. In the acute period the injections cause a slight burning sensation, which soon ceases under the analgesic action of the remedy.

Diagnosis and Treatment of Tertiary Syphilis. (*Medical Bulletin*, vol. xvii., No. 4, April, 1895.) By William S. Gottheil, M.D.

In the treatment of tertiary syphilis iodine and its compounds are mainly to be relied upon, but mercury fulfils an important indication, and cannot be omitted. The ordinary treatment with iodide of potassium is usually sufficient, though very frequently the dosage is entirely too small. Patients with gumma frequently do not respond to ordinary doses, and it must be pushed to an extent that is limited only by the endurance of the patient's stomach. All the devices of the recumbent posture, counter-irritation over the epigastrium, the administration of the drug in milk, and with ice, must be employed to get as much as possible of the drug into the system; and the rectum, which absorbs the iodide very well, must be called to our aid. The iodide of sodium is sometimes borne when the potassium salt is not. Or the new iodide, that of rubidium, may be used. It costs more than the commoner salts, but that is a thing hardly worth considering when it is a question of saving tissues and organs from destruction. It has not nearly the disturbing effects on digestion that the potassium and sodium salts have, and it can therefore be borne in larger doses. Dr. Gottheil has not observed the disturbances of the circulatory apparatus and the depression of the heart which are so baneful when large doses of potassium iodide are exhibited. It is a valuable addition to our armamentarium in these tertiary-syphilis cases.

Coincidentally with the iodides mercury must be employed in small doses,

and in bad or refractory cases the employment of the soluble salts by hypodermic injection is an important and valuable resource.

As regards the local treatment, its main lines are as follows: The non-ulcerated gumma should be covered with mercurial plaster, even when fluctuation is distinctly apparent, since resorption takes place sometimes even under those circumstances. If ulceration has occurred, iodoform in the shape of a powder or an ointment is to be used.

If, however, the destructive process is active, and the gummatous ulceration advances in spite of our efforts, it is proper to attempt to stop it by an energetic cauterization of the infiltration that forms the advancing margin of the gummatous sore. In exulcerating gummata of the trunk and the extremities caustic potash in stick should be freely employed, the tumor tissue being thoroughly bored into and cauterized. For the smaller ulcerations of the face, buccal cavity, etc., the nitrate-of-silver stick can be employed in the same way.

It is of the greatest importance, in these localities, to stop the ulcerative process as soon as possible; and if necessary either the Paquelin cautery or the galvano-caustic point should be employed.

NEUROLOGY.

IN CHARGE OF LANDON CARTER GRAY, M.D.,
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GUY HINSDALE, M.D.,
Philadelphia,

AND

WILLIAM BROADDUS PRITCHARD, M.D.,
New York City.

Abscess of the Left Occipital Lobe, Causing Object-Blindness, Word-Blindness, etc. (*Liverpool Medico-Chirurgical Journal*, January, 1895.) By Alfred W. Campbell, M.D.

The patient, a man forty-three years old, a "bookmaker," had been deaf in the left ear for thirty years, and had been troubled with a discharge from the same ear for ten years. He had been subject to attacks of giddiness for three months. While walking one day, he became suddenly confused and completely aphasic. He afterwards walked one and a half miles to his home, and recovered the power of speech by the next morning. From that time he complained of oppression at the vertex of the cranium, suffered from partial object-blindness and word-blindness, and frequently miscalled words. In writing he arranged the letters incorrectly, making y's and f's turn and finish upward instead of downward. There was no word-deafness. Ophthalmoscopic examination showed no abnormality at the fundus and the fields of vision were normal. Several attacks followed; he complained of left-sided occipital cephalalgia, and acquired delusions of persecution and visual hallucinations. He was then admitted to the hos-

pital. A well-marked double optic neuritis existed, and limitation of the left field of vision. He progressively deteriorated until he was entirely blind. No localized disorder of common sensibility could be found, the knee-jerks were exaggerated. The motor aphasia was present during the seizure only : he spoke at other times clearly and sensibly. Rotary nystagmus, ataxia, and special weakness of the trunk muscles came on ten days before death, the latter being due to respiratory failure.

At the autopsy the left cerebral hemisphere was larger and heavier than the right, and bulged into the occipital segment. Beginning opposite the anterior margin of the precuneus, and flattening all the sulci from within outward, it extended to the occipital lobe, which was rounded instead of being pointed. Horizontal section of the left hemisphere showed a centrally-situated abscess of the size of a turkey's egg, which was full of thick, yellowish-green pus. The inflammatory tissues around the abscess extended to the centre of the hippocampal and uncinate gyri, the subcallosal fasciculus, the posterior pillar of the fornix, the optic thalamus, and the tegumentum cruris of the left side. The whole upper surface of the cerebellum was flattened, softened, and congested to a depth of half an inch. Microscopical examination showed degeneration of the postero-external columns of the spinal cord. The author compares the clinical phenomena and the pathological lesions. He thinks that the object-blindness can be attributed to destruction of the left primary visual centre, the right being intact and rendering the object-blindness incomplete. The word-blindness and paralexia may have been caused by destruction of the centre in the angular gyrus, or by severing the tracts by which visual impressions reach this centre, as the lesion was situated at or about the point where the fibres from the right occipital lobe join those from the left on their way to the angular gyrus. The paraphasia was probably due to destruction of the left occipital primary visual centre. As regards the transitory aphasia, the author considers the theory plausible that excessive and exhausting stimulation of the motor speech centre by impulses arising in the irritant parts near the abscess and passing to that centre may have caused a temporary paralysis.

Subcortical Glioma of the Cerebrum affecting Principally the Arm-Centre ; Removal ; Recurrence of the Growth ; Recovery. (*University Medical Magazine*, Phila., January, 1895.) By A. C. Wood, M.D.

The patient was a man, aged twenty-eight, a bartender, who for eighteen months had noticed occasional twitchings in the left hand, recurring, finally, several times a day. They began with a tearing sensation in the hand ; movement and sensory disturbances came on almost simultaneously. Sometimes the attacks were not attended by loss of consciousness. Later, the first movements were followed almost at once by unconsciousness and a fall to the ground ; the mouth drawn to the left side ; otherwise general relaxation. Headache had grown severe previous to operation. The pain was located in the right temple, and is reported to have prevented sleep for

an entire week. Paralysis of the arm followed violent convulsions and attacks of vomiting. There were double optic neuritis, diplopia, and contracted fields. The patient had been struck on the top of the head with steel knuckles thirteen years previously; he was dazed but did not lose consciousness. No evidence of syphilis.

After the first operation, by Dr. J. William White, there was relief of headache, of spasm and abnormal sensation, and improvement of vision. After the second operation, four months later, the patient walked without a cane, although the left leg was somewhat spastic. The functions of the arm did not improve so much. The knee-jerk became exaggerated on the left side. Seven months after the last operation the patient had loss of power in the arm, but was otherwise well. In this case spasms preceded the hemiparesis and no myotonia was observed.

Endothelioma of the Brain. (*Quarterly Medical Journal*, Sheffield, July, 1894.) By W. M. Jones, M.R.C.S., and W. L. Buxton, M.B.

The patient, a woman aged thirty-five, one year before death complained of severe frontal pain on the right side. The pain came on in paroxysms; during which there was lachrymation, photophobia, slight ptosis, and external strabismus of the right eye; and on ophthalmoscopic examination double optic neuritis was found, which was worse on the right side. There was also severe vomiting during the paroxysm, with discharge of a quantity of blue fluid. A cerebral tumor was diagnosticated, but beyond an area over the right frontal region, which was where the pain commenced and which was always painful to the touch, there was nothing to localize the growth. Blindness and optic atrophy supervened. Death occurred, after vomiting, from exhaustion. The tumor, about the size of a hen's egg, was easily removed, *post mortem*, from the remains of the right frontal convolutions. It proved to be an endothelioma bearing a close resemblance to the "nested sarcoma" described by Gowers.

Spindle-Cellled Sarcoma of the Brain; Removal by Operation. (*Medical News*, April 27, 1895.) By C. L. Dana, M.D.

The author presented to the New York Neurological Society a man, aged twenty, who, seven years previously, had received a blow on the left side of the head, in the neighborhood of the squamous suture. He was unconscious for a time, but developed no bad symptoms until three years later, when he had general epileptic convulsions, recurring twice a month. Later, he had a sensory aura commencing in the fingers of the left hand, then involving the arm, leg, and face of that side, and finally becoming general.

Hemiplegia of the left side with various forms of anæsthesia, intense headache, and double optic neuritis occurred. A diagnosis of tumor of the brain affecting the centres of the left arm and fingers was made, and on opening the skull a flat, hard tumor was found lying just beneath the dura.

About one-half only could be removed. For six months thereafter the epilepsy ceased, and the pain, headache, and optic neuritis disappeared. Power was partially restored. Later, epileptic attacks recurred monthly, being limited to the paralyzed side, painless and without unconsciousness.

Sarcoma of the Brain Successfully removed by Operation. (*Lancet*, March 16, 1895.) By George R. Murray, M.D., M.R.C.P., and W. G. Richardson, F.R.C.S.

The patient was a man of thirty-six years, with no specific or traumatic history, and who had had no severe illness. Without premonitory symptoms, as far as known, he was seized in February, 1894, with a slight attack of Jacksonian epilepsy. He stated that in this attack his left elbow was raised from his side, and that the forearm was pronated and supinated in the flexed position several times in rapid succession. The attack was limited to the left arm, and he was perfectly conscious all the time. This was repeated in nine days, and four days later a third came on. He continued at work for a week, when one day he felt cold and was seized with nausea, which was followed by a severe attack of vomiting. He then lost some power in the left arm, which became ultimately paralyzed. The leg became involved likewise, and attacks of vomiting continued. Pain settled in the right temporal region. There was well-marked, double optic neuritis, rather more advanced in the right eye. The vision was $\frac{6}{12}$; fields normal. The pupils acted, though not very briskly, to light and accommodation. Sensation to touch, pain, heat, and cold was unaffected. The muscular sense was lost for the left arm. The knee-jerk was much exaggerated on the left; it was also more active than usual on the right. Ankle clonus could be obtained on the left side, but not on the right. On July 1, 1894, the tumor was removed from the upper Rolandic region on the right side. The operation lasted one hour and was not difficult. The tumor was a sarcoma measuring three by two inches. The patient recovered, and eight months later had regained good use of the affected limbs.

Tumor of the Cerebellum, with Bulimia and Recurrent Apoplecticiform Seizures. (*Boston Medical and Surgical Journal*, January, 1895.) By J. T. Eskridge, M.D.

The patient was a Swedish laborer, aged twenty-six, who was under observation seven months previous to death. When first seen he was nearly comatose, vomited, and showed retraction of the cervical muscles, but there was no paralysis. The knee-jerks were equal and exaggerated. Ankle clonus, plantar, cremaster, and abdominal reflexes were absent. There were choked disks and retinal hemorrhages. Two days later he regained consciousness; nausea and vomiting occurred even when no food had been taken. Later on intense craving for food, with deafness and blindness, occurred. The patient became more stuporous and had general convulsive movements. There was pronounced cyanosis of the face. Diagnosis:

Tumor of the cerebellum or corpora quadrigemina. At the autopsy a mixed sarcoma of the small, round, and spindle-cell form, one and a half inches long and one inch wide, was found on the anterior portion of the middle lobe of the cerebellum.

A Case of Pseudo-Hypertrophic Muscular Paralysis with the Knee-Jerks Preserved. (*Lancet*, May 4, 1895.) By W. S. Colman, M.D., M.R.C.P.

The case occurred in a boy who, at the age of five, was first noticed to be "weak on his legs," and to have unusually large calves. At the age of ten he walked with an awkward and rather high-stepping gait and a tendency to pes cavus. There was commencing slight contracture of the gastrocnemii on both sides. These muscles, as well as the vasti externi, were weak though enlarged. There was over-excitability of these muscles to stimulation by a faradic current. A current too weak to produce contraction in a healthy child at once caused a contraction in these muscles, and the reaction was greater on the left side, on which the hypertrophy was also most marked. To the constant current all muscles responded normally. The knee-jerks, when the patient was first seen, were extremely active, but later became more moderate, though not lost.

Sarcoma of the Brain; Extirpation. (*Deutsche medicinische Wochenschrift*, No. 23, 1894.) By O. Riegner.

Riegner removed a round-cell sarcoma of the size and shape of a goose-egg, involving the central convolutions and extending deeply into the brain substance of the left hemisphere, and accompanied by marked double choked disks. Three days after the operation ophthalmoscopic examination showed a diminution in the swelling and œdema of the right disk and the vessels could be followed to the centre. One month afterwards the vision was reduced to perception of light in the right eye, while he could count fingers at ten feet with the left. At the end of the four months the ophthalmoscope showed complete atrophy of the right disk, the outlines of the left were hazy, and the nerve white, except on the nasal side, which was of a grayish-red color.

OBSTETRICS AND GYNÆCOLOGY.

IN CHARGE OF RICHARD C. NORRIS, M.D.,

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An Epidemic of Gonorrhœal Vulvitis in Infants, due to Infection by a Thermometer. Neill and Barjon, of Lyons (*Bulletin Médicale*), report this epidemic.

The first case was that of a little girl who presented, at the time of her

entrance to the hospital, a discharge in which the specific gonococcus was found. The main features of the epidemic were, first, that the vulvitis was distributed very irregularly, skipping some beds, and, secondly, that the disease was disseminated very rapidly, especially after a typhoid patient had contracted it. By comparison of these two factors, the idea of its possible propagation by the thermometer was aroused. The rectal temperature of every patient had been taken morning and evening. The thermometer had been disinfected each time after using, in a solution of phenol. It was then dried, and dipped in vaseline to facilitate its entrance to the bowel.

Infection by the thermometer explained all of the points observed in the epidemic. The temperature had been taken by passing to the beds from right to left from one end of the ward to the other, and the order of the distribution of the disease was the same. The rapid invasion after the infection of the typhoid patient was easily accounted for, as the temperature of this patient was taken eight times during the day and several times at night. Anal infection did not occur in a single case.—*Revue des Maladies des Femmes*, March 25, 1895.

Three Cases of Tetanus in a Gynæcological Service. Meinert (*Archiv für Gynäkologie*, No. xlv.) has had three cases of tetanus in his service during the last eight months. The first patient had trismus and stiff neck eight days before she entered the hospital, and four days after an abortion caused by a kick on the vulva by her brutal husband. The spasms were diminished by injections of chloral, but soon became violent again. Suspecting the retention of fragments of the placenta, the uterus was dilated and a Bozeman's catheter introduced for the purpose of giving an intra-uterine injection. The patient, nevertheless, succumbed to the disease on the fifth day after she entered the hospital.

In the second case the uterus was curetted for carcinoma and injections were given as before. The patient survived eleven days after this operation.

The third patient died of tetanus thirteen days after a salpingo-oöphorectomy.

In these three cases the same catheter was used for intra-uterine injections, and the author thinks that this instrument carried the infection from the first patient to the two others. It was disinfected by plunging it in boiling water for ten minutes and then placing it in a five-per-cent. solution of phenol. According to Kitasato these measures were not sufficient to destroy the organisms.—*Revue des Maladies des Femmes*, March 25, 1895.

Latent Cancer of the Uterus; Invasion of both Ureters with Consecutive Renal Atrophy, with Classical Symptoms of Chronic Interstitial Nephritis. (*Annals of Gynæcology and Pædiatry*, May, 1895.) By A. Peron, M.D.

The patient, aged fifty-six, never complained of symptoms referable to

the uterus, and vaginal examination revealed nothing abnormal. The diagnosis of chronic interstitial nephritis was made from the anasarca and swelling of the lower limbs, the abundant, slightly albuminous urine, and the apparently enlarged heart, whose area of dulness could not be exactly measured, as the patient was very fleshy.

Under a milk diet the anasarca disappeared, but œdema of the left leg continued, and was considered a unilateral nephritic œdema. *Bruit de galop* and polyuria were present up to the time of death, which was due to a cerebral manifestation of the disease. At the autopsy, a cancer of the cervix uteri was found, limited to the middle portion, and invading the back of the bladder and compressing both ureters. The uterus was considerably dilated, both tubes were distended, being the size of the small intestine. The œdema of the left leg was found to be due to cancerous glands which had invaded the iliac vein. The right kidney was destroyed, the left was atrophied, the pelvis was dilated and contained urine and purulent *débris*. The heart was not hypertrophied; the other organs were normal. The most remarkable features of the case are absence of uterine symptoms, a chronic interstitial nephritis caused by compression of the ureters, the polyuria in spite of advanced renal atrophy, and a *bruit de galop* without hypertrophy of the heart or of the left ventricle.

Observations on the Relationship of Pelvic Diseases to Psychic Disturbances in Women. (*Medical News*, April 27, 1895.) By P. T. Vaughan, M.D., of Tuscaloosa.

The author claims that pelvic disease in women is not the great etiologic factor in the causation of insanity among women that it is commonly held to be. Of three hundred women admitted to the Alabama Insane Hospital during the past two years, one hundred and fifty gave no evidence of pelvic disease. The remaining one hundred and fifty were carefully examined, but the pelvic lesions found were not considered a sufficient cause of insanity. Ten per cent., or fifteen of the one hundred and fifty women who were examined, had conditions present which could be said to be pathologic; but there was also present some other disease which was a much more probable causative factor in the production of insanity. In eight a history of insanity in the family was obtained, eight had heart-disease, four, chronic nephritis, one, chronic pulmonary tuberculosis, and in two no bodily disease was discovered, but the family histories were very bad.

The author further states that twelve per cent. of all the women admitted have heart-disease.

The ninety per cent. remaining of the number who complained of pelvic disease showed only slight leucorrhœal discharge with no other evidence of pelvic disease. It is only a local manifestation of a generally lowered systemic condition.

Records of the last eighty-nine autopsies of females show normal generative organs in forty-three instances; pathological conditions, trivial in

character, in twenty-seven,—the lesions found varying from a fibroid a quarter of an inch in diameter to a very slight laceration of the cervix; and in nineteen the pelvic disease was serious in character, but there was also present in every case, except one, grave bodily disease which was the probable cause of the insanity. Of this number eight had chronic tuberculosis; one, syphilis and tuberculosis; seven, chronic nephritis; one, endocarditis; one, general paresis; and in one no disease was discovered.

Vicarious Menstruation from the Breast. (*Medical Progress*, May 11, 1895.) By Joseph L. Hancock, M.D., of Chicago.

Vicarious discharge of blood from the breast, which would seem to be more apt to take place than some other phases of vicarious menstruation because of the intimate connection between the breast and the uterus, is, nevertheless, of rare occurrence.

In the case reported, a woman, thirty-one years of age, has a discharge from the left breast which begins three days before the menstrual period. This discharge is at first whitish in color, then becomes bloody, and finally yellowish. It terminates suddenly when the menstrual flow appears, but reappears again at the close of the uterine flow and lasts two or three days. This discharge first appeared one and one-half years after her youngest child was born (now ten years old), at whose birth the cervix was lacerated, which gave rise later to menorrhagia with scanty menses. It has been a constant feature of menstruation since that occurrence. Other noticeable features in the case are that the right breast always remains passive; galactorrhœa is present during the nursing periods; and an escape of fluid occurs from the left breast during coitus.

PATHOLOGY.

IN CHARGE OF ALLEN J. SMITH, A.M., M.D.,

Professor of Pathology in the Medical Department of the University of Texas, Galveston, Texas,

AND

HENRY W. CATTELL, A.M., M.D.,

Demonstrator of Morbid Anatomy in the University of Pennsylvania; Prosector to the American Anthropometric Society; and Pathologist to the Presbyterian Hospital, the Institution for Feeble-Minded Children at Elwyn, etc.

Results of Autopsies in Cases Dying after Treatment with Diphtheritic Antitoxin. (*Medical Record*, April 20, 1895.) By George P. Biggs, M.D., of New York.

Eighteen autopsies were included in this report, fifteen of the cases having showed involvement of the larynx. Diphtheritic membrane was found in only twelve cases, in four of which it was limited to the pharynx, larynx, and upper trachea, in six it covered the pharynx and tonsils, in two there was deep necrosis of the tonsils. Enlargement of the cervical glands

was usually present. Parenchymatous and fatty degeneration of the heart, liver, and kidneys was constantly found, and was more advanced in cases which came late under treatment. The antitoxin when administered early checked and prevented destructive changes. Complicating lesions were most common in the lungs. Bronchitis existed in every case, twelve showing purulent secretion with intense inflammation of the bronchial and peribronchial structures. Distinct membrane was found in the bronchi in only one case. Pneumonia was present in all except two. The consolidation was lobar in one instance and lobular in the remaining number. The percentage of broncho- or lobular-pneumonias was eighty-eight, a proportion much higher than that usually given. This fact would tend to show that the improvement in mortality under the antitoxin treatment of diphtheria is due to its influence on cases not complicated by broncho-pneumonia. Acute fibrinous pleuritis complicated two cases; acute exudative nephritis was found in two, and in each instance the patient did not receive antitoxin until the seventh day of the disease, and death occurred two days later. The spleen was usually found congested. The lesions of antecedent disease were chiefly of a tuberculous character, five of the autopsies revealing marked tuberculosis. Syphilitic cirrhosis of the liver was marked in one case and slight in another.

The average age of the patients was two and a half years, the eldest being five and a quarter years, the youngest eight months. The duration of the disease prior to the administration of the antitoxin averaged 4.4 days. The immediate cause of death in sixteen of the eighteen cases was diphtheria or some of its complications. Two cases were complicated by general miliary tuberculosis; two patients were dying when they entered the hospital; two were treated with serum of an inadequate strength, and one did not receive any. The nine cases remain for consideration as to the apparent failure of the antitoxin treatment. Two of this number died of extensive broncho-pneumonia, the death of a third was caused by fatty degeneration of the heart, acute exudative nephritis, and the septic condition of the patient when admitted to the hospital. In six cases there was laryngeal involvement requiring intubation, and all were complicated with broncho-pneumonia.

The writer makes the following deductions:

1. That antitoxin has a decided influence in loosening diphtheritic membrane, even in cases resulting fatally.
2. That it has comparatively little influence on the cases already complicated by broncho-pneumonia.
3. That it has a marked influence, when administered early, in preventing and checking parenchymatous and fatty degeneration.

Normal and Surgical Anatomy of the Vermiform Appendix. (*Medical News*, May 4, 1895.) By Hadley Williams, M.D.

The author, from his work on this subject in the dissecting-room, and from post-mortem examination of adults and also the foetus in the different

stages of development of the alimentary canal, draws the following conclusions:

1. The development of the alimentary canal readily explains abnormal positions.

2. At the twelfth and sixteenth weeks there seems to be no difference in size between the base of the appendix and the cæcum.

3. Prior to the sixth and seventh months the cæcum and appendix lie well up in the abdomen, behind the liver or median line.

4. The appendix is nearly always found covered by peritoneum, and in most cases possessed of a mesentery.

5. There is generally a well-marked muscular circular coat.

6. The relative measurements between the exit of the appendix and the ileum are pretty constant.

7. The appendicular artery lies behind the distal portion of the ileum, and is accessible to pressure.

8. The wall of the appendix is always formed by the anterior band of muscular fibres from the cæcum.

9. The appendix is readily filled with air from the cæcum. In only a few cases did this fail.

10. From its position in a pocket-like cavity it is accessible to pressure from an impacted large bowel.

11. Fæces collected in the lumen of the appendix do not necessarily set up any pathologic disturbance.

12. Air or fluid injected into the large bowel invariably rotates the cæcum outward, in close relation to the anterior superior spine and crest of the ilium.

13. In this experiment the appendix is often dragged into abnormal positions and twisted on itself.

14. When ulceration takes place, with extraperitoneal formation of pus, two layers of serous membrane are involved if the appendix be intraperitoneal. Anatomically, it is possible for pus to separate the layers of the appendicular mesentery.

15. The lowest part of the abscess-cavity in the recumbent position is on a level two or three inches lower than the incision in front and above Poupart's ligament.

16. An intimate relation sometimes exists between the tubes and ovaries with the appendix. In such a case suppurative appendicitis and hæmatosalpinx were both present, though no distinct suppurating tract could be traced between them.

17. A swelling in the right iliac fossa will give rise to similar symptoms from like anatomic relations to important viscera, vessels, and nerves.

18. When a large collection of pus has formed in the iliac fossa, a tender spot may generally be felt in the lumbar region on the crest of the ilium, close to the sacro-iliac articulation. A downward incision at this point will be sufficient to evacuate the abscess.

MISCELLANEOUS.

PROFESSOR CHARLES S. MINOT, of Boston, in discussing the fundamental difference between plants and animals, defines the two primary divisions of life in the following words: "Animals are organisms which take part of their food in the form of concrete particles, which are lodged in the cell protoplasm by the activity of the protoplasm itself. Plants are organisms which obtain all their food in either liquid or gaseous form, by osmosis (diffusion)." If the myxomycetes are veritable plants, and botanists are by no means agreed to accept them as such, they form practically the only exception to the above definition, because they, while in the plasmodium stage of their last cycle, take solid particles of food very much after the amœba fashion.—*Science*, March 22, 1895.

DR. P. A. PREOBRAJENSKY has treated three out of four cases of tetanus successfully with inhalations of chloroform. These were repeated from one to three times a day, the dose varying from two to four drachms in the twenty-four hours. Hot baths and morphine hypodermically were also employed.—*Edinburgh Medical Journal*, March, 1895.

DR. C. E. RICHMOND, of Manchester, suggests bistourage or subcutaneous torsion of the spermatic cord for the purpose of cutting off the blood-supply of the testis, causing its subsequent atrophy. This is done successfully in the lower animals.—*Edinburgh Medical Journal*, March, 1891.

Influence of the Force of Gravity on the Circulation. (*Lancet*, February 9, 1895.) By Leonard Hill, M.D., of London.

This writer has found, first, that the important duty of compensating for the simple hydrostatic pressure of gravity in changes of position must be ascribed to the splanchnic vaso-motor mechanism; second, that the effect of changing the position affords a most delicate test for the condition of the vaso-motor mechanism; third, that the compensation is far more complete in upright animals, such as the monkey, than in rabbits, cats, or dogs, and therefore is probably far more complete in man; fourth, that when the power of compensation is damaged by the paralysis of the splanchnic vaso-constrictors, induced by severe operative procedures or injuries to the spinal cord by asphyxia, or by some poison, such as chloroform or curare, then the influence of gravity becomes of vital importance; fifth, the horizontal and feet-up position at once abolishes the syncope induced by the feet-down position by causing the force of gravity to act in the same sense as the heart, and thus the cerebral circulation is renewed; sixth, that bandaging the abdomen has the same effect; seventh, that if the heart is affected, as by curare-poisoning, the restoration of the pressure is incomplete, and it is possible that the heart may be stopped altogether by the in-rush of a large

quantity of blood caused by the too rapid application of pressure on the abdomen; eighth, that vagus inhibition and cardiac acceleration are compensatory mechanisms in the feet-up position and feet-down position respectively; ninth, that chloroform rapidly paralyzes any compensatory vaso-motor mechanism and damages the heart; tenth, that ether, on the other hand, only paralyzes the compensatory vaso-motor mechanism very slowly and when pushed in enormous amounts; eleventh, that the vaso-motor paralysis induced by these anæsthetics lasts for some considerable time after their removal; twelfth, that the chloroform can, by destroying the compensation of gravity, kill the animal if it be placed with the abdomen on a lower level than the heart; thirteenth, that elevation or compression of the abdomen immediately compensates for the vaso-motor paralysis produced by chloroform; fourteenth, that compression or elevation of the abdomen, coupled with artificial respiration and with squeezing of the heart through the thoracic walls, is the best means of restoring the animal from the condition of chloroform collapse (these results are opposed to those of the Hyderabad Commission); fifteenth, that the feet-down position inhibits respiration, and that the feet-up position accelerates it; sixteenth, that in the feet-down position the respiration is thoracic in type, and the abdomen is contracted; in the feet-up position the respiration is diaphragmatic, and the abdomen freely extended; seventeenth, in the feet-up position the free and full expansion of the abdomen withdraws all obstacles to the compensatory dilatation of the abdominal veins. In the last part of the paper the medical aspects of this research are discussed. It is suggested that emotional syncope is due to paralysis of the splanchnic area, and a case is quoted where compression of the abdomen immediately removed the syncopal condition. The same treatment—or that of elevation of the abdomen—is suggested for conditions of shock, chloroform collapse, and after severe hemorrhage. Finally, a parallel is drawn between some of the results of this research, in reference to monkeys, and those obtained by Dr. George Oliver on man, by measuring the diameter of the radial artery with his ingenious instrument, the arteriometer.

DR. FURSENO, of Copenhagen, believes that the adoption of the “red room” in the treatment of small-pox will reduce the mortality, shorten its duration, and prevent the formation of scars.—*Edinburgh Medical Journal*, March, 1895.

DR. C. MANSELL MOULLIN considers the prostate to be an accessory organ of generation, and having nothing to do with micturition, and but a secondary connection with the urethra; its function being to add certain constituents to the seminal fluid, at the time of its discharge, which serve to arouse and maintain the slumbering vitality of the spermatozoa.—*Edinburgh Medical Journal*, March, 1895; original in *Journal of Anatomy and Physiology*.

FORENSIC MEDICINE.

IN CHARGE OF LORENZO D. BULETTE,
Of the Philadelphia Bar.

LIABILITY OF A RAILROAD COMPANY TO COMPENSATE A SURGEON EMPLOYED BY ITS CONDUCTOR IN AN EMERGENCY TO ATTEND AN INJURED EMPLOYEE.

IN the case of railway accidents at points along the line distant from towns, or where the services of a surgeon of the company cannot at once be obtained, it frequently happens that a surgeon or physician of the locality is called upon, by the conductor of the train or other employee, to render medical or surgical assistance to a servant of the company injured in the accident, and it subsequently becomes necessary to ascertain the liability of the company to compensate the surgeon for services rendered under such circumstances. It has been held that while there is no general liability on the part of a railroad company to provide surgical aid for sick or injured servants, nor has the conductor of the train any general authority to employ a surgeon in such case, yet an emergency may arise which will invest the conductor with such authority. The facts which constitute such an emergency appear in the case of the *Terra Haute, etc., R. R. Co. vs. Murray*.¹

At F., a way station, distant many miles from the principal offices of the defendant company and from the residences of its chief officers, C., a brakeman in the service of the company, had his foot crushed between the wheel of a car of the train on which he was employed as a brakeman, and a rail of the track. The injury was received at one o'clock on the morning of July 2, 1881, and was such as to demand immediate surgical attention. The conductor of the train requested Doctor M., who was a surgeon residing in the town of F., to render the injured brakeman professional aid, and informed him that the company would pay him for such services.

At the time the accident happened, and at the time the surgeon was employed, there was no officer superior to the conductor at the town of F. There was at the station a resident agent who had full knowledge of the injury to C. and of the surgeon's employment. This agent was in telegraphic communication with the principal officers of the company, but did not communicate with them. In an action to recover the amount of his

¹ 98 Ind. 358.

fee, the trial court held the railroad company liable for the reasonable value of the services rendered by the surgeon, and awarded him one hundred dollars.

The company denied its liability under the circumstances, and Mr. Justice Elliott, who delivered the opinion of the Supreme Court, to which the case was carried on appeal, said,—

“In ordinary cases a conductor or other subordinate agent has no authority to employ surgical assistance for a servant of the corporation who receives an injury or becomes ill. We do not doubt that the general rule is that a conductor has no authority to make contracts with surgeons, and if this principle governs all cases the discussion is at an end; but we do not think it does rule every case, for there may be cases so strongly marked as to constitute a class in themselves and one governed by a different rule.

“The authority of an agent is to be determined from the facts of the particular case. Facts may exist which will greatly broaden or greatly lessen an agent's authority. A conductor's authority in the presence of a superior agent may dwindle into insignificance, while in the absence of a superior it may become broad and comprehensive. An emergency may arise which will require the corporation to act instantly, and if the conductor is the only agent present, and the emergency is urgent, he must act for the corporation, and if he acts at all, his acts are of just as much force as that of the highest officer of the corporation. In this instance the conductor was the highest officer on the ground; he was the sole representative of the corporation; he it was upon whom devolved the duty of representing the corporation in matters connected within the general line of his duty in the sudden emergency which arose out of the injury to the fellow-servant immediately under his control; either he, as the superior agent of the company, must, in such cases, be its representative, or it has none. There are cases where the conductor is the only representative of the corporation that in the emergency it can possibly have. There are cases where the train is distant from the supervision of superior officers, where the conductor must act, and act for the company, and where, for the time and under the exigencies of the occasion, he is its sole representative, and if he be its only representative, he must, for the time and the exigency, be its highest representative. Simple examples will prove this to be true. Suppose, for illustration, that a train is brought to a halt by the breaking of a bolt, and, to enable the train to proceed on its way, may not the conductor employ the mechanic? Again, suppose a bridge is discovered to be unsafe, and that there are timbers at a neighboring mill which will make it safe, may not the conductor, in behalf of his principal, employ men to haul the timber to the bridge? Once more, suppose the engine of a locomotive to be disabled, and that it is necessary to at once move the train to avoid danger, and there is near by a competent engineer, may not the conductor employ him to take the train out of danger? In these examples we mean to include, as a silent factor, the fact that there is an emergency, allowing no

time for communicating with superior officers, and requiring immediate action. If it be true that there are cases of pressing emergency where the conductor is on the special occasion the highest representative of the company, then it must be true that he may do, in the emergency, what the chief officer, if present, might do. If the conductor is the only agent who can represent the company, then it is inconceivable that he should, for the purposes of the emergency, and during its existence, be other than the highest officer. The position arises with the emergency and ends with it. The authority incident to the position is such, and such only, as the emergency imperatively creates.

“Assuming, as we may justly do, that there are occasions when the emergency is so great, and the necessity so pressing, that the conductor stands temporarily as the representative of the company, with authority to the urgent and immediate demands of the occasion, we inquire what is such an emergency as will clothe him with this authority and put him in the position designated? Suppose that a locomotive is overturned upon its engineer, and he is in immediate danger of great bodily harm, would it not be competent for the conductor to hire a derrick, or a lifting apparatus, if one were near at hand, to lift the locomotive from the body of the engineer? Surely some one owes a duty to a man, imperilled as an engineer would be in the case supposed, to release him from peril, and is there any one upon whom this duty can be so justly put as upon his employer? The man must, in the case supposed, have assistance, and do not the plainest principles of justice require that the primary duty of yielding assistance should devolve upon the employer rather than on strangers? An employer does not stand to his servants as a stranger: he owes them a duty. The cases all agree that some duty is owing from the master to the servant, but no case that we have been able to find defines the limits of this duty. Granting the existence of this general duty, and no one will deny that such a duty does exist, the inquiry is as to its character and extent. Suppose the axle of a car to break because of a defect, and a brakeman's leg to be mangled by the derailment consequent upon the breaking of the axle, and that he is in imminent danger of bleeding to death unless surgical aid is summoned at once, and suppose the accident to occur at a point where there is no station and when no officer superior to the conductor is present, would not the conductor have authority to call a surgeon? Is there not a duty to the mangled man that some one must discharge? And if there be such a duty, who owes it, the employer or a stranger? Humanity and justice unite in affirming that some one owes him this duty, since to assert the contrary is to affirm that upon no one rests the duty of calling aid that may save life. If we concede the existence of this general duty, then the further search is for the one who in justice owes the duty, and surely, where the question comes between the employer and a stranger, the just rule must be that it rests upon the former.”

BOOK REVIEWS.

OBSTETRIC SURGERY. By Egbert H. Grandin and George W. Jarman. With eighty-five illustrations in the text and fifteen photographic plates. Pp. 207. Philadelphia: F. A. Davis Co., publishers, 1894.

Our opinion of this book, which we have carefully read, is that it is a most excellent guide to the practice of modern obstetric surgery. Its style is dogmatic, explicit, and without literature references, which all the more increases its value as a book for students and those practising obstetrics as a part of their general work. There is no doubtful tone in its statement that "aseptic and electric obstetrics rob labor of its terrors and the puerperal state of wellnigh its sole risk." Asepsis and antisepsis are dwelt upon throughout the book in greatest detail, and, when each operative procedure is described, the cases in which each should be elected, and its thereby improved results, are clearly set forth.

The book contains nine chapters. The chapter upon Obstetric Asepsis and Antisepsis presents in detail the modern and practical rules of cleanliness and antisepsis in obstetric work. Under Obstetric Dystocia and its Determination, the great value of pelvimetry is insisted upon and the method of its employment is described. In their description of internal pelvimetry the authors almost disregard instrumental aid, and place more reliance upon estimating the true conjugate by the finger or hand introduced into the vagina, under anæsthesia, in very important cases. We believe that an extended experience in pelvimetry in pelvic deformities will convince the examiner that the more recent instruments devised for the direct measurement of the conjugate vera will give results far more exact, and will thus measurably assist elective operation, which the authors advocate as the key-note of their volume. The chapters describing Artificial Abortion and Induction of Premature Labor, Forceps, and Version contain clear and explicit teaching; the indications, contra-indications, and methods of technique are graphic and well illustrated with diagrammatic cuts and photographic plates, the latter from photographs of a manikin. As the book will doubtless fall into the hands of many medical students and those unskilled in forceps application, we would suggest that there be incorporated in a future edition a more elaborate description of the method of applying the blades to the sides of the child's head.

For fear of endangering surgical cleanliness in obstetric manœuvres, we would hesitate to advise the introduction of the finger into the rectum to deliver the head after removal of the blades of the forceps. Although the advice never to use the forceps as a rotator is sound for beginners, those of larger experience will agree that this use of the forceps is not always harmful and sometimes is most efficient.

The sections devoted to Symphyseotomy and Cæsarean Section contain all the information that recent obstetrics has added to our knowledge of the widened field of their usefulness. The conclusions of the authors as to the usefulness of the revival of symphyseotomy are, in our judgment, wisely conservative. They say, "However bright the prospects of the operation are for the future, it still remains true that for the present it will find its chief field in maternity hospitals. We feel that as yet a sufficient number of cases are not on record to warrant the physician in stating that there are no untoward results as regards locomotion." Embryotomy is ably discussed, and the ground is taken that the operation upon a living fœtus will never become elective. The work concludes with chapters upon the Surgery of the Puerperium and Ectopic Gestation. In the former immediate repair of the lacerated

cervix is described and recommended. Primary perineorrhaphy, fistulæ, and rupture of the uterus are fully described. The surgical treatment of puerperal endometritis, metritis, and peritonitis is discussed with a strong predilection to the use of a single douche and the curette, followed promptly by cœliotomy in cases not quickly relieved by the former. The authors have evidently given much thought to this very important subject, and, while to some practitioners their advice may seem to be too radically surgical, on the whole it is a fair presentation of the dangers of delay and the unfortunately poor results of surgical intervention. With the authors' evident desire to elevate obstetric surgery to its deserved plane that it may no longer be hampered by old ideas of watchful expectancy, we are surprised that electricity finds a place in the treatment of ectopic pregnancy, even restricted to the very early period to which the authors have restricted it.

As we read the book these few comments occurred to us. A real criticism searches for errors in statement of fact and in doctrines taught. The work before us is free from both, and it should and will have a place in the teaching of modern obstetric surgery.

R. C. N.

A MANUAL OF THE MODERN THEORY AND TECHNIQUE OF SURGICAL ASEPSIS.
By Carl Beck, M.D. Philadelphia: W. B. Saunders, 1895.

The author, following the German school, is very enthusiastic in his preference for the aseptic method of wound treatment, as compared with the antiseptic method. A very considerable space in the work is devoted to bacteriology, as a proper understanding of this subject is most essential in the accomplishment of asepsis.

The technique of aseptic operations is explained in its minutest details, and some special operations are described which may be studied with profit.

The work as a whole presents very clearly the theory and technique of surgical asepsis, and we can strongly recommend it to any one who wishes to familiarize himself with this subject.

H. R. W.

THE TREATMENT OF WOUNDS, ULCERS, AND ABSCESES. By W. Watson Cheyne, M.D. Edin., F.R.S., F.R.C.S. Philadelphia: Lea Brothers & Company, 1895.

The writings of Mr. Cheyne, who has been so intimately associated with Mr. Lister since the early days of antiseptic surgery, cannot fail to attract the interest of the medical profession, and may be accepted as a fair index of the present status of antiseptic surgery in Great Britain. The author expresses himself decidedly in favor of the antiseptic method of wound treatment in preference to the aseptic method, which has very largely supplanted the former, both upon the Continent and in this country. Mr. Cheyne gives carbolic acid a high place as a germicide, and, we think, wisely calls attention to the dangers of its use in the case of young children. The details of the antiseptic method are carefully and clearly set forth, and, although we cannot accept all of Mr. Cheyne's views, we cannot fail to be impressed with the earnestness of his work in the field of antiseptic surgery. We are sure that the reader interested in these subjects will be repaid by a careful study of the work, and can recommend it most highly.

H. R. W.

BOOKS RECEIVED.

TRANSACTIONS OF THE MEDICAL SOCIETY OF THE STATE OF NORTH CAROLINA.
Forty-first Annual Meeting, held at Greensboro', N. C., May 15, 16, and 17, 1894.
Wilmington, N. C.: Jackson and Bell, 1894.

INTERNATIONAL MEDICAL MAGAZINE.

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JULY, 1895.

[No. 6.

ORIGINAL COMMUNICATIONS.

REMARKS UPON TREPHINING THE CRANIUM.¹

BY JOHN ASHHURST, JR., M.D.,

Barton Professor of Surgery and Professor of Clinical Surgery in the University of Pennsylvania, Surgeon to the Pennsylvania Hospital, etc.

I FIND that I have performed the operation of trephining the skull forty-one times, not including those cases in which I have merely opened the frontal sinuses, nor those in which I have removed bone-fragments without using the trephine. Of these forty-one cases, twenty ended in recovery and twenty-one in death, showing a mortality of a little more than fifty per cent. In many instances I have refrained from interference when other surgeons would have operated, so that my cases have been of an unfavorable type, and the mortality has no doubt been higher than if I had operated more indiscriminately.

The details of these cases are as follows: twenty-four were primary operations for compound fracture, with eleven recoveries and thirteen deaths; two were operations during the intermediate period, both successful; and three were secondary operations, with one recovery and two deaths, both in cases of abscess.

As far as it goes, this analysis confirms what has so often been pointed out, that there is not as much urgency in operating upon compound fractures of the skull as there is in the case of compound fractures in the extremities. In the latter, the sooner the operation is done, if the patient is able to bear it, the better. This has long been the rule in military surgery when amputation is required, and some years ago I collected extensive statistics from

¹ Report of a verbal communication made to the Philadelphia Academy of Surgery, May 6, 1895.

civil practice which showed that the same rule of procedure applied there. But this is not so in compound fracture of the skull, and the proportion of recoveries is larger in delayed cases than when the operation is done immediately, as is well shown by Bluhm's statistics. At the same time, in a bad case, where an operation is evidently necessary, I do not advise delay; but early trephining is not so imperative as in early amputation for compound fractures of the long bones. Trephining for suppuration occurring as the result of injury is usually fatal.

In three cases I have operated for syphilitic disease, with two deaths and one recovery. In the latter case, besides evidence of syphilitic brain-disease, there were painful nodes in the skull, and I operated by dividing the nodes with a Hey's saw, and then made a single opening with the trephine, so as to relieve the intracranial tension. The patient was much benefited for a time, and left the hospital relieved, though not cured. The fatal cases were in patients suffering from syphilis of long standing, with necrosis and intracranial suppuration.

I have been induced to trephine in three cases of epilepsy; all the patients recovering from the operation. One, an epileptic with suicidal tendencies, came under my care at the University Hospital in October, 1886. After the operation the patient was much benefited as long as he remained under observation. In the other two there was no evident improvement, though both did as well, as regarded the operation. In a case of melancholia, following an old fracture of the skull, trephining gave no relief, and in two cases in which I have operated for convulsions, etc., following old injury, one terminated fatally, while no permanent gain resulted in the other.

I have operated unsuccessfully upon three patients for the cerebral complications resulting from disease of the middle ear. Statistics show that many lives have been saved by trephining under these circumstances, but in my own cases, though abscesses have been reached and evacuated, the patients have died.

Although I have thus operated in twenty-one fatal cases by trephining, in only one case did the operation seem to have been responsible for the patient's death. This case was that of a child with a depressed fracture over the lateral sinus. On removing the depressed bone profuse hemorrhage occurred, and the patient died in consequence. I had not then learned the futility of attempting to check bleeding from the brain sinuses, except by prompt plugging. I have had four cases since in which the longitudinal sinus was opened, and in two of these the patients recovered. In a third, bleeding was readily controlled by pressure, but ultimately death followed, while in the fourth a clot had formed in the sinus, giving time to apply a lateral suture to the divided vessel. This case was an interesting one; it was that of a boy who had been injured by a nitro-glycerin explosion, a piece of metal being found lodged in the longitudinal sinus, causing a clot as mentioned.

As regards the locality of the injury, I find that of fractures involving the frontal bone, omitting those simply involving the frontal sinuses, there were five, with four recoveries and one death. These figures do not confirm the general impression that there is a special danger in fractures of the frontal bone. Indeed, much more depends upon the amount of injury to the brain than upon the place of fracture. In one case the indication for trephining was bleeding from the middle meningeal artery, and in that case the patient recovered. He was an athlete who, while playing foot-ball, came into violent collision with another player, sustaining a fissured fracture of the parietal bone. He was stunned at the time, but soon recovered consciousness; in the course of half an hour, however, convulsions came on, followed by coma. He was brought to the hospital, and I applied the trephine, evacuating a considerable amount of clot; the patient made an uninterrupted recovery.

In terminating the discussion which followed this communication, Dr. Ashhurst said,—

In reply to the last question, I wished to be understood as saying that I would not push the argument from statistics, and that in cases in which the operation was clearly indicated I would operate at once; but that in cases where there was a doubt in the mind of the surgeon as to whether he should operate or not, a short delay would not be as dangerous as it would be in the case of amputation. In cases of impacted fracture my practice has been, as a rule, not to interfere in the absence of symptoms. In cases where there is no opening into the cranial cavity and where there are no cerebral symptoms, I think that the surgeon is justified in waiting for more definite indications. At the same time, I find myself more inclined to operate than I was twenty years ago, on account of the greater safety afforded by modern methods of wound-treatment.

With regard to Dr. Harte's question, I do not recall any case of discharge of brain matter from the ear; but loss of brain substance not infrequently occurs at the seat of fracture. With regard to the watery discharge from the ear, I have often observed that as long as the discharge continues the patient may do well, but that if it suddenly stops, the patient will probably become comatose and die in a few hours, the arrest of this flow seeming to increase the pressure upon the brain. Old residents of the Pennsylvania Hospital will remember a case under the care of the late Professor Joseph Pancoast, in which there had been such a free discharge from the ear that it had been collected in a cup to be measured. The cup was found empty in the morning, and upon investigation it was learned that the night-watchman had mistaken it for medicine and administered it to the patient, a tablespoonful every three hours during the night.

With regard to fractures at the base of the skull, I have not seen any case in which I thought trephining indicated. I think that an attempt should be made to prevent infection in these cases by cleansing the ears, and, as far as possible, the nasal and buccal cavities. After securing clean-

liness, I rely upon the use of calomel and Dover's powder, with hygienic treatment, rest in bed, cold to the head, laxative enemata, etc., and by these means recovery will be obtained in a considerable number of cases.

DISPLACEMENTS OF THE UTERUS, AND THEIR TREATMENT BY MEANS OF PESSARIES. HAVE THEY A CURATIVE EFFECT? HAVE THEY ANY PRACTICAL VALUE?

BY ANDREW F. CURRIER, M.D.,

New York City.

It has often been urged against gynæcologists, especially by those whose work is limited to internal medicine, that they greatly exaggerate the significance of displacements of the uterus: the uterus being a mobile organ and especially susceptible to changes of position anteriorly, posteriorly, or laterally, whether in the impregnated or unimpregnated condition, why should such changes result in the alleged disturbances and call for so much manipulatory treatment?

While it is true that certain forms of displacement may for a time give rise to very little discomfort to the patient, while it is also true that some forms of displacement are much more significant than others, and also that some individuals are more intensely disturbed by these troubles than others, it is also true that the uterus cannot be deviated very far from what is now generally conceded to be its normal position or its normal range of position, especially if it becomes fixed in such a malposition, without detriment and discomfort to the individual.

The position of a normal unimpregnated uterus, with the woman in the standing position, should be with its body at an angle of from one hundred and thirty to one hundred and forty degrees with its neck, the latter being approximately in the vertical plane of the body. This statement differs from the widely-accepted statement of Schultze that the relation of body to neck is more nearly ninety than one hundred and thirty degrees.

The organ is normally mobile in almost any direction, but if in a healthy condition tends to return to its normal position when forcibly displaced. It may be more or less elevated as the bladder becomes filled, and tends to fall forward as the latter is emptied, but I have observed it many times in the course of abdominal sections when its position seemed entirely independent of any relation to the bladder; hence I do not agree with Schultze's idea that the uterine body usually rests to a considerable extent upon the bladder. The supports of the uterus, the round, broad, and uterosacral ligaments, and the vagina with its firm investment of cellular tissue,

poise it very sensitively in the pelvis, while the intestines more or less closely surround it, without interfering with its action under normal conditions. Thus sensitively poised, its equilibrium is very readily disturbed, especially by sudden blows and shocks. We must not forget, either, though these references may seem all too elementary, its abundant blood-supply, its lymphatic circulation in the peritoneum which covers it, and in its lining endometrium, and its rich nerve-supply, both cerebro-spinal and sympathetic, with their important direct relations to the kidneys, stomach, and intestines. Constantly active, constantly functioning, engorged by the stimulus of the sexual appetite or by the periodic flow of the menstrual tide, constantly developing either a decidua to be cast off with the menstrual discharge, or a foetus with the enormous attendant nutritive changes, is it a wonder that so many of the ills of women are centred in the uterus, and that hysteria, the disease of the womb, should be so often applied to almost any startling and unusual phenomenon which cannot readily be referred to any other organ? If we recall the misery which may come from a thorn in the foot, a sliver in the finger, or a cinder in the eye, we ought to concede the possibility that the ills from which women with displacement of the uterus complain are by no means imaginary.

The question of supporting the uterus by mechanical contrivances when in an unnatural position, of course suggests the variety of malpositions which the uterus may take. Accordingly, it may be displaced forward or backward or laterally, it may descend in the pelvis until it is quite outside the body, or it may be raised to almost any degree in the pelvis by inflammatory action, the growth of tumors, etc. The uterus being a sensitive organ and surrounded by tissues of great sensitiveness, it is obvious that discrimination and good judgment are essential in the application of mechanical supports lest an irritant be added to a condition of irritation which is already sufficiently troublesome. The question of such supports must therefore be at once excluded in those cases in which active inflammation is progressing, or in which, though the process be subacute, the effect of mechanical pressure upon a mass of exudate would convert it into an acute process. Displacements laterally seldom, if ever, demand the use of pessaries. They are of rare occurrence, as would readily be comprehended from the manner in which the uterus is hung in the pelvis, the broad and round ligaments tending to prevent such a displacement. It may occur, however, as the result of engorgement of one side of the uterine circulatory system, from whatever cause, the weight or traction effect of a tumor, the uterus drooping to the heavier side as the result of adhesive inflammation, the contracting adhesions dragging the uterus over, and as the result of pregnancy. An accident of the last-mentioned variety may be very serious. In one of my own cases, years ago, a displacement of this character gave all the symptoms of tubal pregnancy. The diagnosis was confirmed by a gynecologist of large experience, the abdomen was opened, and a normally gravid uterus, acutely displaced laterally, was found. Uteri which are thus

displaced require support, certainly, but not the support which is to be obtained from pessaries.

Anterior displacements offer a field for discussion as to mechanical supports in which there are decided differences of opinion, though there are fewer adherents to this method of treatment than in the days when the opinions of Sims, Hewitt, Thomas, and Peaslee upon this subject were authoritative. Not only has the treatment of such conditions undergone change, the notion itself of what is constituted by anterior displacement has changed. When the fundus uteri dips so far forward that the uterine body is nearly parallel with its neck, there is no mistake that ante flexion is present. As the result of accident or shock such a condition is of great rarity; the shallowness of the peritoneal sulcus between the bladder and the uterus tends to prevent it; but a more important element of prevention consists in the retracting force of the sacro-uterine ligaments, which, though principally composed of peritoneum, contain also muscular fibres, and hence are called by some anatomical writers *musculi retractores uteri*. A form of anterior displacement which is not uncommon is the so-called infantile uterus, in which the uterine body dips downward, sometimes almost vertically, while the short and snout-like vaginal portion of the cervix points forward to the symphysis pubis rather than backward to the sacrum. The structure of such uteri is generally hard and dense and the nutrition poor, the fault being usually one of development. Women with such uteri are almost invariably sterile. For a long time it was considered proper by the most eminent gynecologists to treat such displacements either by a cutting operation, which was devised by Sims, or by a pessary or crutch designed to raise the uterus from its malposition. A number of pessaries have been devised to meet the difficulties, including those of Thomas, Hewitt, and Gehrung. They are all difficult of introduction and of removal, usually painful to wear, and, even when they do no harm, seldom do any good. An acutely displaced uterus of this variety, the body of which is freely movable upon the neck, may sometimes be supported with advantage by a pessary. Even a glass or rubber stem, as a means of support and correction, may in some cases be worn within the uterus without harm, its lower end being properly sustained and balanced by a suitable cup pessary in the vagina.

As a rule, such displacements require either very little local treatment by means of pessaries, as the German gynecologists Schultze, Schroeder, and others long ago insisted, or none at all. The displacement cannot be successfully treated until the nutrition of the organ and, perhaps, the nutrition of the entire individual is improved, and then the difficulty can sometimes be rectified by a cutting operation. Improvement in the nutrition is often effected by the stimulus which accompanies marriage, and if the general and local improvement be so great that pregnancy can occur, a physiological cure may thus be effected. It not unfrequently happens that the irritation to the defective muscular structure of the uterus, produced by the developing ovum, results in abortion.

The third variety of displacements which is to be considered is that in which the uterus descends in the axis of the pelvis, and tends to deliver itself as a foetus would be delivered. The descent or prolapsus may be of any degree, even to the extent of causing the uterus to appear entirely outside of the body. With this prolapse comes necessarily a weakening of all the supports of the organ; the round, broad, and utero-sacral ligaments are all stretched and permanently relaxed; the vaginal walls, one or both of them, are similarly affected. Such a condition constantly tends to get worse rather than better. It usually, though not always, comes in mature life or in age, when the muscular force of the body has seen its best days and the processes of atrophy and degeneration are approaching or are present. Consequently the employment of any mechanical support will not meet with that co-operative assistance found in resilient and actively contracting tissues with which it would have met in early life. If any support is used it must act by main force, as a bending wall is supported by an unyielding prop. Such a support means injury to the tissues, from constant pressure, and the alternative is frequently presented to a woman with prolapse, of allowing her uterus to remain outside the body, or to wear a support which corrodes and ulcerates the tissues and gives her constant pain. A number of pessaries have been devised for holding up the prolapsed uterus and vagina, including the Zwank, which is expanded after its introduction into the vagina, and has its points of support at the sides of that cavity; the cup pessary, which sustains the weight of the uterus in a cup while an arm passes outward to the perineum, and a strap attached to its extremity passes backward between the thighs and then upward along the sacrum to another strap which is buckled around the waist; also glass and rubber balls, which must be large enough to fill the vagina. All these devices are clumsy and irritating and seldom answer the purpose which they are intended to serve; straining or coughing will usually force both uterus and support out of the vagina. There is only one effective way of treating this condition, of which I am aware, and that is by a surgical operation; the uterus being reduced in size by the performance of trachelorrhaphy or by amputation of the vaginal portion of the cervix, while the anterior and posterior walls are subjected to colporrhaphy. Even after these operations, the prolapse not infrequently recurs. If the patient has passed the menopause, my preference is to remove the entire uterus, perform anterior and posterior colporrhaphy, and stitch the stumps of the broad ligaments to the vagina. I know of no method but this which will produce a radical cure, and therefore recommend it as superior to all other methods of treating this unfortunate condition. In the very early stages of descent, when the uterus merely rests heavily upon the floor of the pelvis, and before the vaginal walls have begun to prolapse, the unpleasant sensations of weight and dragging may often be relieved by means of a simple Smith pessary, which raises the uterus in the pelvis; but such a procedure will often prove to be only palliative, and preliminary to surgical measures.

The final class of displacements is that in which the uterus falls backward, and in this the pessary finds its greatest field of usefulness. This condition may arise from a great variety of causes, such as the shock produced by a fall, the force of gravity when the uterus is in a condition of subinvolution, or the seat of a tumor in its posterior wall, a relaxed muscular condition which is a part of the relaxation of the entire muscular system such as is often seen in the condition of general anæmia, and many others. It implies disturbance to the uterine circulation, especially the venous portion of it; it brings the peritoneal covering of the uterus in contact with the pelvic peritoneum and thus favors adhesion of the two surfaces; it is a serious menace to the continuance of pregnancy, should pregnancy occur, and it often excites pain, discomfort, and reflex disturbances of varying character and intensity. While there may be cases in which no bad symptoms are manifest, my observation has been that, as a rule, it is always significant of trouble, and demands intelligent attention. If the uterus, thus displaced, is firmly fixed by adhesions which cannot be readily separated, it is not a case for treatment with pessaries, for they would almost certainly fail to remedy the displacement and would be likely to excite a peritonitis which might be serious. If, on the other hand, the uterus is movable, it should first be restored to its normal position by the fingers alone, if possible, or by the assistance of the uterine repositor, and an easy fitting pessary adjusted. The number and variety of instruments which have been devised for treating this condition are legion, and many of them are more than worthless, because positively harmful. The principle upon which the most effective forms of pessary acts, if not absolutely that of the lever, certainly greatly resembles it; and I am confident that in some cases a true lever action is produced.

The elastic ring of Meigs acts by distending the vagina, and by keeping it tense, holds the uterus in a position of unstable equilibrium. If the uterus is small and very mobile, such a support will sometimes answer every requirement. The Hodge, or ox-bow pessary, served a useful purpose in the evolution of the instrument. Its convexity furnished the fixed point of support for the floor of the vagina, but its anterior portion was too short, and its blunt extremities, which were intended to rest against the pubic bones, did not rest there at all, and the movements of the wearer of the instrument sometimes favored its migration to parts which prevented all possible utility as a support to the uterus. The anterior arms being lengthened and brought to a point in the Albert Smith pessary, the conditions became the most favorable possible for the support of the uterus. There is no instrument, so far as I know, which is superior to it; its convexity rests upon the floor of the vagina as a support; its posterior arms pass into the vaginal fornix and impinge against the cervix; its longer anterior arms are enveloped by the vaginal walls, and the more closely the latter are approximated the greater the pushing or lifting force exerted through the posterior arms upon the uterus. In this restored position of the uterus

the utero-sacral ligaments can also exert their customary retracting force, and if they have not become too relaxed and the posterior arms of the pessary do not encroach too much upon their field of action, a well-adjusted pessary will tend admirably to hold the uterus in a position of stable equilibrium. The action of the Smith pessary is sometimes reinforced by a stem of rubber or glass introduced into the cervical canal. I have seldom found it either necessary or desirable, and it implies the use of an additional foreign body, which may introduce a new element of disturbance.

Useful as these instruments are in many cases, an experience of many years has taught me that they seldom effect a radical cure. They require constant attention, they must be frequently removed and cleansed, and they often cause very troublesome ulceration by their continuous pressure. I have kept patients under observation from one to three years with constant use of the instruments, and then have removed them. I do not recall a case in which I was not obliged to replace them, the uterus becoming displaced again soon after the support was taken away. So far from strengthening the supports of the uterus, I think they weaken them, and, like a truss, which is worn for hernia, they must usually be worn for life, unless a surgical operation is performed which will enable them to be dispensed with. Such an operation is Alexander's, the shortening of the round ligaments, and the various forms of hysteropexy.

What conclusions, then, can we draw as to the practical value of mechanical supports for displacements of the uterus?

1. That in lateral displacements they are seldom indicated, and, if required at all, the indication would be better met by a cotton tampon than by any form of pessary which is now in use.

2. That in anterior displacements they are of little value, most of the varieties now or until recently employed being harmful rather than helpful.

3. That in *descensus* of the uterus most of the pessaries now used are clumsy and irritating. The indications are more satisfactorily met by surgical procedures than by mechanical supports.

4. That in posterior displacements pessaries often serve a very useful purpose if properly adjusted and removed sufficiently often for purposes of cleanliness. They are, however, palliative, and seldom entirely curative. The most efficient form of pessary for this condition is the Albert Smith pessary or one of its modifications. Radical cures are most effectually obtained by surgical measures.

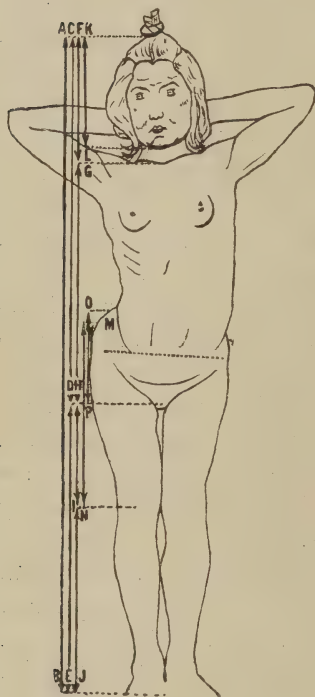
REPORT OF A CASE OF DOUBLE CONGENITAL LUXATION OF THE HIP-JOINT¹

BY W. BARTON HOPKINS, M.D.

THE following case was brought to the Orthopædic Dispensary of the Pennsylvania Hospital by Dr. Hand, January 21, 1895:

Mary S. V., aged twelve years, a very healthy, well-nourished, Italian girl. Examination of the hips reveals the presence of both femoral heads upon the dorsa ilia firmly set in new sockets. These sockets, while allowing a freedom of motion of the heads almost entirely normal, hold the latter so firmly in place that they yield but little to forcible traction downward and forward, none upward and backward; there is very marked lordosis, the knees are slightly knocked, and the toes normally turned out. The deformity being bilateral, the shortening of the thighs is, of course, uniform, and; by referring to the diagram carefully prepared by Dr. J. M. Spellissy, it will be seen that the thighs are relatively shorter than the legs (Fig. 3). The child's gait, though characteristic of the condition, is good; she can walk fast, run, climb, and jump from heights of three or four feet with ease. She has no pain in the hips or back. In view of her excellent health, the comparatively perfect condition of the new hip-joints, the good gait, and the freedom from pain, no treatment has been for the present employed, but the case will be kept under careful observation.

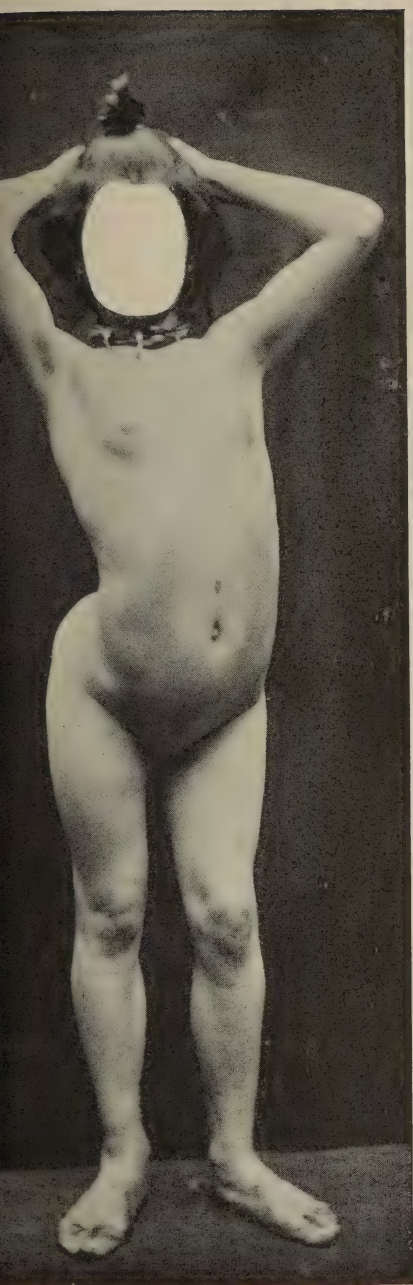
FIG. 3.



Dr. James P. Warbasse (*Annals of Surgery*, March, 1895) gives an interesting *résumé* of congenital dislocations of the hip-joint, treated by Schede, who has, since 1880, treated twenty-nine congenital luxations of the hip by non-operative (orthopædic) methods. His method rests upon the fact that in the majority of children with congenital hip luxations, in whom no

secondary changes have been caused by walking, a simple traction upon the leg and a slight abduction suffice to place the head in the acetabulum, and that, further, a moderate lateral pressure upon the great trochanter is all that is necessary to retain the head of the bone in its position. After the child has begun to walk, the prognosis is less favorable. By the end of the second year, certainly in the third, changes have become so marked that simple

¹ Read and the patient exhibited at the meeting of the Orthopædic Section of the College of Physicians, March, 1895.



Hopkins's case of congenital luxation of the hips.
Anterior view.

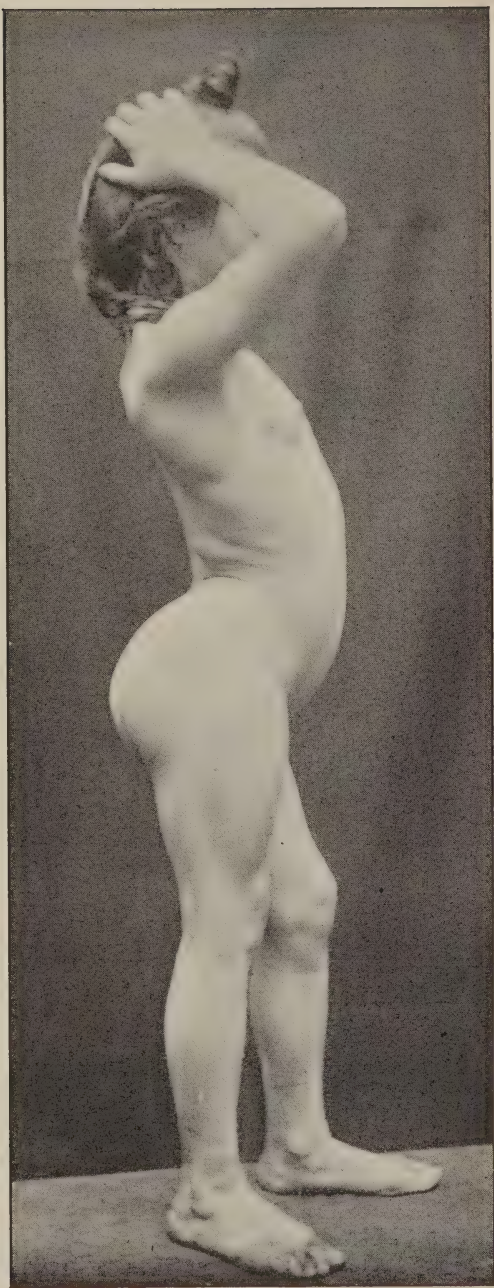


FIG. 2.—Side view.

manual extension no longer suffices to reduce the deformity. But in such cases continuous extension by means of weights for a few weeks or months so restores the positions that, with abduction and pressure over the trochanter, the head of the bone may be made to go back in its place, and remain so firmly fixed that pressure upon the sole of the foot no longer causes it to ride out. In order to combine the lateral pressure over the trochanter with extension, Schede has had constructed a splint apparatus. This splint should be worn till a cure is effected, and a duplicate splint should be kept on hand for contingencies. At night moderate extension of four or five pounds is kept up by air-pillow leg-girt.

The ages ranged as follows: One of eleven months, four under eighteen months, eleven from seventeen months to four years, sixteen from two to five years, seven from three to seven years, four from eight to ten years. Of the cases treated by Schede, it will be seen, therefore, that a large proportion were under five years of age, and that his method would not be applicable to a case where growth and development have so adapted themselves to the abnormal arrangement of parts as they have in this case.

KEY TO DIAGRAM.

	Inches.
A—B, height total	48.36
C—D, height vertex to pubic arch.....	27.25
D—E, height pubic arch to ground.....	21.12
F—G, height vertex to sternal notch	9.25
G—H, height dorsal, sternal notch to pubic arch.....	18.00
H—I, height pubic arch to patellar centre.....	7.25
I—J, height patellar centre to ground	13.25
K—L, height vertex to chin	6.72
M—N, height summit of trochanter to lower border of external condyle	13.72
O—P, height summit of iliac crest to pubic arch.....	6.48
Diameters anterior spines of ilia.....	7.36
Diameters iliac crests	8.25
Diameters, intertrochanteric	8.72

Supposing this child's vertico-pubic measurement to be normal, then her lower limb, as measured from the pubic arch, is short by 1.63 inches. But her vertico-pubic measurement is *not* normal, since, consequent to her luxated hips, she has a marked lordosis and such a backward tilting of the pelvis that her genitalia present posteriorly, and it is really the pubic convexity that confronts the tape in place of the pubic arch. These abnormalities have shortened the vertico-pubic measurement the .96 of an inch. Were her spine and pelvis in normal position it would increase the disproportion of her lower limb, which would then be 4.41 inches too short. So, as she stands, she is 5.37 inches shorter than she ought to be. Now, her leg happens to be 1.58 inches too short (an independent idiosyncrasy); subtracting this from the pubic arch-ground measurement, we find the thigh in its pubic-patellar centre quantity is 2.83 inches too short. This is due to the displacement upward of the head of the femur. Measurement of the bone

from the summit of the trochanter to the lower border of the external condyle confirms the fact.

The lateral obliquity of the pelvis suggests the existence of a lateral spinal curve. The condition, however, is wholly one of posture. She always stands with her left knee slightly flexed, even when her heels are together; this causes the pelvis to tilt downward to the left, and she automatically compensates by tilting her shoulders to the right.

(The anthropometric tables of Quetelets were used in computing the proportions given.)

THE DISSECTING-ROOM.¹

BY E. W. HOLMES, M.D.,

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I HAD anticipated the pleasure of reviewing the various problems in the practical management of the anatomical room, in order to derive advantage from the experienced discussion and criticism of those present, but the exigencies of time and space enjoin their omission.

I would not have ventured upon the selection of this topic in this presence were it not for the evident neglect of this important branch of medical study of late years. That anatomical study is the basis of all medical knowledge, that a dissecting-room, a supply of bodies, and a corps of teachers are absolutely necessary, have always been axioms. But more than that, what has been done in the majority of the schools? Look at the immense improvements in other branches. Twenty-five years ago well-equipped physiological, chemical, and physical laboratories were uncommon; pathological museums were almost unknown, except in name; and practical hygiene and bacteriology were not in existence. To-day the opportunities for research in any one of these would busy a lifetime; but in anatomy we stand only on the basis of the needs of a quarter of a century ago. Formerly anatomy claimed a good one-seventh of the required studies; to-day, it but weakly elbows a space with twenty ologies and specialties which have been elevated by their more enthusiastic advocates.

We often estimate the speed of our train by the rapidity with which we rush by stationary objects; and conversely, as practical anatomists, we can see how we have stood still, by the rapid passing of the collateral branches which have asserted their importance and taken to themselves the time and attention which our branch needs.

¹ Read before the Section of Anatomy, Pan-American Congress, September 1893.

One of the main reasons has been the teaching methods in vogue—more instruction by lecturing and fewer instructors required—which has practically resulted in the added emphasis of the lecture system and the minimizing of the personal supervision in dissection. The clinical method of bedside instruction in medicine and surgery does not obtain, as it should, in the dissecting-room of to-day. This is peculiarly unfortunate. Lecturing methods are especially ill fitted for impressing our facts. Really, the exigencies of practice of medicine and surgery demand the application of these facts through the eye and hand and not by the ear, and yet the best lecturer cannot exhibit his dissection to more than fifty students seated around him; when you remember that in the larger schools often there are seven hundred, you appreciate how really ineffective is the method. Not that I deprecate in the least the value of the experience of the accomplished anatomist who directs in his lecture the novice in his studies; but a lecture course cannot teach, it can only point out the way, while the real learning must be done by the student himself, in his room, and at the cadaver.

The emphasis, however, is always laid upon the attendance during the hours of the lecture, and the compulsion is upon the examination of these lectures. There is hardly a medical school that absolutely insists upon the student being present at fixed hours in the dissecting-room. Dissecting, of course, is obligatory, and it sets apart certain periods for dissecting, when the student can come if he wishes to,—like the ancient almanacs that stretch across the whole month's page, "Look out for rain about this time." Students are divided into small sections for bedside instruction in clinical medicine and surgery, but never for dissecting work. Who ever heard of modernized teaching facilities for the dissecting-room? There is nothing beyond the cadaver, and the corps of teachers, and a skeleton or two, and the few nude pictures of three decades back. The museum is for the illustration of the lectures, and is separated far and wide from the anatomical room. Then the anatomical room itself,—it is a dirty place, as you know. If there is any extra paint or adornment, it does not go there. It is the most unattractive room in the school, and the most inaccessible.

I need not apologize for wishing that something could be done to vivify the interest in our noble science. There is no branch, of so much practical usefulness, about which there is such palpable ignorance in the profession as this. Further, when you think that chemistry, physiology, etc., may be conducted and studied at a distance, but human anatomy only in the medical school, the need of stimulating the student to use all his efforts to avail himself of opportunities, which assuredly for the majority will never come again, is most imperative.

The remedy is not far to seek. The methods so successful elsewhere should be applied to the study of anatomy. The classes should be divided into small sections for the "bedside study" of the cadaver. Skilled instructors who make this a specialty should be continually at the elbow

to encourage, direct, and drill. A demonstrator of anatomy should not be a practitioner, but a specialist, spending his whole time in the rooms and saturated with the anatomical atmosphere. No one can fulfil the office of a teacher who is not filled full of his subject. The hours of the sections for histology or hygiene are fixed and certain; so it should be here, and not left to an elastic, sweet will, which too often does not will to go at all. The anatomical room should properly be in a building by itself, of but one story, easy of access, so that it may be the haunt of the pupil when not otherwise engaged, or when an empty one-fourth hour should tempt to the speedy elucidation of some single point. There should be ample facilities for instruction,—“strike while the iron is hot” is the right principle. I will guarantee that a specimen, well worked out, placed in the hands of a student *while engaged upon a given part*, is of ten times the worth to him that it is when held up at the distance of twenty feet in the midst of a formal lecture, or when kept high upon the sacred shelf of the medical museum. The museum in a medical school is usually of comparatively little use. Each dissecting-room should have its own collection of moist and dry specimens in jars, or in cases, of ready access when the student may be most interested, and therefore most needs it. This dissection is a two-headed Janus, for we must dissect in order to know, yet in order to dissect intelligently we must have some foreknowledge, and this paradox is best solved by the study of the moist and the dry preparations, which the student should be encouraged to examine, both before and after as well as during the procedure of dissection.

Then, the instruction should be direct and personal. Here, as in every-day life, the greatest philanthropist is not he who helps many, or insists upon the unfortunate doing his way, but rather the one who kindly helps when help is needed, and without protrusion of self, gently lifts the fellow out of the rut of wrong doing. “A friend in need is a friend indeed” implies that the proper aid is given just at the time required, not before. Demonstrations therefore should be personal and upon the cadaver, not a mere recital of facts. Class demonstrations are useful particularly for a rapid *résumé* to the more advanced student, but the speech-making should be subsidiary to the demonstration of structure. An ideal method, perhaps, would be to encourage each student to carefully prepare and preserve his own dissections, as thereby a stimulus to more careful work would be acquired, and at the time of demonstration each would have in his hands a dissection upon which to follow the explanation of the teacher.

I have spoken of the emphasis laid upon the examination after the lecture course. This is only a means to an end, but to the majority it is the *ultima thule*. It would be far better to exact an examination upon each dissection, and at the end of the course a finality upon the cadaver.

I have already disclaimed any intention of detracting one iota from the value of lectures, but really how opportune if the phonograph could be utilized for this purpose! Let the most able and scientific of this society

write out a series of lectures which could be spoken into the instrument by the most eloquent member. Then a tyro could turn the crank and deliver to a delighted audience the most perfect of courses, and these could be multiplied indefinitely so that each medical school could be supplied on demand, while thereby could be secured that uniformity of nomenclature which has harassed the minds and hearts of our members for a considerable season.

There is one other point I wish to touch upon. It is the absence of systematic records of anomalies and pathological lesions, which would be of extreme value if properly noted, and in all the schools the yearly waste of magnificent material which could readily be utilized for scientific purposes. You think that a dissecting-room is only for the study of anatomy? There is a wealth of pathology, a richness of surgical knowledge, a treasure of medical story, a mine of anomalous relations, all gone, burned, or buried. Like the early miner of the West, in our haste and with our careless or crude methods, we overlook the very gold we fain would grasp, and some more careful worker will enrich himself and his race from the waste which we throw away.

I have endeavored to point out some of the more glaring defects in the anatomical room, which stand in the way of its improvement.

1. It is subordinated to the lecture method, which rightly should be subordinate to it.
2. It is too often repulsive and inaccessible.
3. It is not managed with the precision that we find in other departments.
4. The teaching facilities are rarely what they should be, and should be supplemented by an extensive museum, ready of access, under proper regulations, to the student, who should be allowed to handle the specimens himself.
5. The teaching should be personal and demonstrative rather than didactic.
6. The test should be a practical knowledge of the cadaver rather than of merely theoretical data.
7. A proper record of all anomalies and pathological lesions found should be kept, and the invaluable specimens added to the teaching facilities of the various departments of the school.

SOME UNUSUAL CASES IN ABDOMINAL AND PELVIC SURGERY.¹

BY MILO B. WARD, A.M., M.D.,

Of Topeka, Kansas.

ONLY a few years ago surgery of the abdomen and pelvis was not sanctioned by the vast majority of physicians and surgeons, and it was especially essential that current medical literature should be filled with the reports of cases treated by the limited number of operators then working in this field. At present, however, in abdominal and pelvic work the majority of cases are without special interest to the general practitioner, and so common in the experience of the specialist, that it is hardly worth while to occupy the time of this society by referring to them. The few cases which I shall report have occurred in my practice since we convened at Des Moines, Iowa, last December.

CASE I.—PYOMETRA; TUMOR WEIGHING THIRTY POUNDS; OPERATION BY CELIOTOMY; RECOVERY.

Mrs. F., aged twenty-two, married for three years, mother of two children, the younger three months old at the time of the operation. The history of the case as given by her attending physician, Dr. Billingsly, of Belleville, Kansas, is about as follows: Nothing unusual occurred in parturition, and recovery was rapid until about the twelfth day, when Mrs. F. had a severe chill accompanied by tenderness in the lower part of the abdomen. From this time on, she complained constantly of chilly sensations and great soreness above the pubis, soon involving the entire abdomen in tenderness. About one month after the birth of the child, she noticed an enlargement in the region above the uterus, which caused her some alarm, and her physician was summoned. Nothing definite was determined regarding the cause of her condition, and temporary treatment was prescribed with a view of watching the case. Mrs. F. rapidly grew large, and at the same time weak and thin. Her temperature during this time was not taken, but the history shows there must have been some fever. The abdomen growing so rapidly caused her physician to be alarmed regarding her condition, and he corresponded with me, giving me the history about as I have stated. This was nearly ten weeks after the birth of the child. I was not able to diagnose the condition without seeing the patient, and informed the physician that it would be best to have her come at once to my hospital. The arrangements were made as soon as possible, and she came about twelve weeks after her confinement. Her appearance was most pitiable; a very small woman, weighing not over eighty pounds, carrying a tumor as large as a full-term gestation. Her pulse ranged from 140 to 160 per minute, and the temperature from 101° to 104° F. Upon examination, I decided that the tumor must be of pus. Digital examination showed the uterus involved in the tumor; but the conditions were so obscure that I resorted to the

¹ Read before the Western Association of Obstetricians and Gynecologists, at Omaha, Nebraska, December 27, 1894.

use of the sound to confirm my diagnosis. The sound passed into the uterus two inches and a half, and I was led to believe that I had been in error and that the uterus was not involved. Two other physicians examined the patient, and they also were uncertain regarding the diagnosis. The patient was placed on concentrated food, such as beef juice, milk, eggs, etc., and frequently bathed with water and alcohol to increase her strength and vitality, so that she might better bear an operation. Instead of improving, the patient failed rapidly under this careful *régime*, and we were obliged to operate to save her life. The operation was done upon the diagnosis of a pus tumor in the abdomen, without knowing its exact origin. An incision was made in the median line of the abdomen, and in order to reach the pus sac, it was found necessary to go through a muscular wall below the peritoneum, confirming the primary diagnosis. A large quantity of very offensive pus was evacuated. I attempted to separate the uterus from the abdominal parietes, but found it impossible to do so; the uterus and the abdominal wall were one solid growth. I then enlarged the incision up to and beyond the umbilicus, only to find that the intestines and uterus in that part of the abdomen were one mass of adhesions. I separated a few coils of intestine, but finally had to abandon that part of the work, because the patient was apparently dying on the table. The opening into the pus-sac had been kept closed by large tissue forceps while trying to separate the adhesions between the uterus and the intestines. The intestinal peritoneum was so much injured in this dissecting process that the Paquelin cautery had to be used extensively to control the oozing. After thorough irrigation with hot water, the upper portion of the abdominal incision was closed by interrupted deep sutures of silkworm gut; the uterus was sutured tightly to the abdominal wall to prevent the possibility of pus entering the peritoneal cavity; the pus cavity was washed and scraped, and a large quantity of pyogenic membrane was removed; a glass drainage-tube was then inserted, and the patient put to bed,—to die, as I supposed. In four hours after the operation, her temperature had fallen from 104° to 100° F., and the pulse had gone down from 160 to 120 per minute. The after-treatment consisted of the most nutritious diet, and frequent irrigation of the pus cavity through the glass drainage-tube. After forty-eight hours the patient seemed to be entirely out of danger, and from this time on the recovery was rapid and uneventful. One week after the primary operation, Mrs. F. was again placed upon the operating-table for the purpose of making an opening into the pus-sac by way of the cervical canal. This was done by means of a blunt sound being passed up, crowding the uterus into the abdominal incision, so that I could cut down on the instrument from above. I then passed a rubber drainage-tube through this opening, enabling me to drain the pus per vaginam. Rubber, glass, and bone drainage-tubes were used as the case progressed. The patient went to her home four weeks after the operation, with the abdominal incision healed, save a small sinus for drainage, and with a bone drainage-tube in the cervical portion of the uterus. Mrs. F. has made a perfect recovery, and has been doing her own work for several months. There is still a sinus the size of a goose-quill in the abdominal wall, and probably always will be, but it does not cause the patient any trouble.

The most important feature in the history of this case is the fact that the examination indicated that the uterus was not involved, while it actually formed the tumor wall. So far as I could judge, only that portion of the uterus above the Fallopian tubes or the extreme fundus was implicated in the tumor formation. The case is unique in my experience. The pus removed weighed thirty pounds. In order to complete the operation it was necessary to administer heart stimulants hypodermically.

CASE II.—DERMOID CYST, WEIGHING THIRTY POUNDS; RECOVERY.

Mrs. M., aged thirty-two, married, mother of two children, aged ten and twelve respectively. The patient has always been in good health until within the last year, during which time she has lost flesh and strength quite rapidly, and when brought to my hospital by her physician, Dr. Janes, of Williamsburg, Kansas, was quite weak, although able to walk about the house. A tumor had been growing for a number of years, but its growth was so gradual that the patient had not considered her condition critical until quite recently. The tumor was diagnosed cystoma of the left ovary. Upon opening the sac with the trocar, we were confronted by complications entirely unlooked for, and its use had to be abandoned entirely, because the thick contents of the cyst would not flow freely, and the presence of sebaceous matter blocked the instrument. As much of the fluid as possible was removed, and the abdominal incision was enlarged to allow of the removal of the large tumor. An ovarian hæmatoma the size of a large orange was removed from the right side. We washed the intestines quite as one would wash linen, since some of the contents of the cyst had escaped into the abdominal cavity. The abdomen was closed without drainage, and the patient placed in bed without experiencing the least shock. Her recovery was rapid and uneventful. She returned to her home in four weeks after the operation.

The unusual feature in this case is the nature of the contents of the sac, a portion of which I herewith present you for examination. There was a large quantity of long straight hair growing from the cyst wall, and an equal amount of loose hair in short pieces floating through the tumor contents, a portion of which formed neuclei for what I call "moth-balls," of which there were about one gallon and a half. These balls, or marbles, as you will see by the specimens which I present, vary from the size of moth-balls, as manufactured and sold by druggists, to that of small walnuts. They seemed to be composed of sebaceous matter, and were evidently formed around the short hairs by the motion of the fluid produced by walking or riding. There was some tissue resembling true skin attached to the inner wall of the sac. My friend and assistant, Dr. J. L. Gilbert, professor of histology and pathology in the Kansas Medical College, has kindly prepared these drawings, which nicely represent the histological peculiarities of this sebaceous matter. So far as I know, only one case of the kind has been reported, and that by Dr. Mundé.

CASE III.—LARGE OVARIAN CYST; UNIVERSAL ADHESIONS; HEMORRHAGE CONTROLLED BY SEVERAL YARDS OF STERILIZED GAUZE; RECOVERY.

Mrs. D., aged sixty, widow, mother of seven children, the youngest thirteen years of age. There is a history of hallucinations amounting to confirmed insanity, which has caused confinement in an asylum for the greater part of six years. The asylum records give no history of tumor growth upon her entrance into the institution, and no examination had been made until about six months ago. At this time the patient's health began to fail, and the tumor grew rapidly, revealing a condition which caused the asylum attendants some alarm. I saw the patient in consultation with the superintendent, and recommended an early operation in order to save the patient's life, without any thought, however, that her mind would be improved by

the operative procedure. Owing to many delays, common in institutions of this kind, the operation was postponed until the patient was in such a critical condition that I considered it unsafe to attempt the operation at the asylum, where skilled nurses could not be had, and brought her to my private hospital. The contents of the sac were readily carried off by the trocar. Every inch of the cyst wall was firmly adherent to the abdominal peritoneum and to the intestines, so that the dissection was tedious and the bleeding alarming. To control the general oozing, several yards of iodoform gauze were packed tightly into the abdominal cavity and allowed to remain for twenty-four hours. The patient was profoundly shocked, but salt water per rectum, hypodermic injections of strychnine, digitalin, etc., were resorted to, and she rapidly recovered. Her mental condition was apparently restored during the first twenty-four hours after the operation. She went to a boarding house in Topeka five weeks later, a perfectly well woman, both physically and mentally, and has remained so for three months.

I do not report this case with the view of putting on record the fact that this patient has temporarily recovered her mental equilibrium as the result of this operation; but, nevertheless, it is interesting to be able to make this statement. That she may have a return of her mental aberrations is to be expected. I may note further that the uterus was firmly bound in the retroflexed position, which may account largely for the insanity. I cannot state that this condition was present when she was admitted to the asylum. There is, however, necessity for more thorough investigation, by competent specialists, of all cases giving a history of pelvic disease when admitted to asylums.

CASE IV.—INSANITY WITH HOMICIDAL TENDENCIES; DISEASED PELVIC ORGANS; COMPLETE RECOVERY.

Mrs. S., aged twenty-seven, mother of two children, aged two and four years. History of fair health until about one year ago, when she was attacked by violent hallucinations, and during this time she attempted, on several occasions, to take her own life, to escape the terrible catastrophe which she supposed was about to overtake her. Her confinement in an asylum had been of short duration at the time I was called to see her, in consultation with the superintendent. Upon examination I found the uterine adnexa enlarged, firmly adherent, and extremely tender. I recommended the total extirpation of the appendages as the humane thing to do, and also expressed the hope that the patient's mental equilibrium would be restored by the operation. The husband was sent for, and readily consented to the plan; the operation was done at the State Insane Asylum, in Topeka, July last. The patient was discharged from the institution four weeks after the operation, and has remained entirely well ever since. The time is too short to state that her mind has permanently recovered, but I am of the opinion that she will never have a recurrence of her mental trouble.

CASE V.—GENERAL PERITONITIS; PATIENT BEDRIDDEN FOR ONE YEAR; TWO OPERATIONS; RECOVERY.

Mrs. G., aged twenty-nine, married twelve years, mother of one child, born ten years prior to her sickness. The patient has always been healthy until January, 1893, at which time she had a severe attack of influenza, during which she was very critically ill and was confined to her bed for eight consecutive months. I saw the patient the first week in October, 1893, in consultation with Dr. Harvey, of Council Grove, Kansas. Her suffering was largely confined to the pelvic organs. She had

been treated by her physician for inflammation of the pelvic organs and general peritonitis, without relief. Her temperature had ranged from 100° to 104° F., and the pulse from 120 to 140 per minute for months. The night before I saw her, after hours of extreme suffering, there was a discharge of fluid per vaginam. She estimated the quantity to be at least one gallon, and she supposed that she was pregnant and that the amniotic fluid had escaped. Prior to this discharge of fluid, the abdomen had been considerably distended, making the diagnosis of her condition very obscure. Mrs. G.'s suffering was so intense that her screams had often been heard by the neighbors. At the time of my visit the patient was quite free from pain, partly as the result of morphine which had been taken in large quantities the night before. There was general tympanites, and the pelvic organs were so sensitive that it seemed cruel to complete the examination. The uterus and appendages were firmly fixed, and surrounded by plastic exudate. There was almost constant vesical tenesmus, and micturition caused extreme suffering. I unhesitatingly recommended prompt operative interference, with a view of removing the diseased adnexa, separating adhesions, etc. Mrs. G. was eager to have something done at once, but her weakened condition made the risk very great, and her husband was opposed to any attempt being made to remove her to a hospital for an operation. However, her physician insisted that an operation presented the only hope for recovery, and, after some preparation, she was placed on a cot-bed, taken to the depot in a spring wagon, placed in a baggage-car, and brought to Topeka, where she arrived October 16, 1893. After a few days of preparation, celiotomy was done. The omentum lying next to the bladder was adherent to that organ, making it necessary to ligate and sever it; the appendages were buried out of reach and could not even be outlined, and there were many bands of adhesions narrowing the lumen of the intestine. These adhesions were severed and the bowel released so far as was possible under the circumstances, a Paquelin cautery was used freely to control oozing where ligation was not possible, and the incision was closed without drainage. The patient improved rapidly, and when she returned to her home, seven weeks after the operation, she was able to walk to the carriage. Mrs. G. gained in flesh and strength, and was soon able to assume the duties of her home. In March, 1894, Mrs. G. one evening indulged in a hearty meal of boiled cabbage, etc., and a few hours afterwards was attacked with a severe chill, accompanied by severe pain in the bowels and followed by persistent vomiting, which continued unabated for several days. There was at no time complete obstruction of the bowel. The symptoms pointed to appendicitis. During this time the temperature reached 105° F. and the pulse 140. Her physician had but little hope of her recovery. After remaining in bed about eight weeks, she was again brought to my hospital, in order that she might receive careful nursing and judicious diet. My diagnosis of her condition was peritonitis, due to an attack of appendicitis. I recommended another operation as the only means of relief. During the four weeks of her stay in my hospital prior to the operation, which occurred June 12, on almost every occasion of bowel movement the suffering was so great that artificial stimulation and the use of morphine in large doses were necessary. One of the peculiar conditions observed was that the epigastric region would sink in towards the spine during these attacks, making an indentation that would permit a small cocoanut to be buried almost out of sight. Her temperature at these times would reach 104° F., and the pulse 160. Mr. G. would not consent to another operation until he had fully concluded that his wife was about to die. Dr. Harvey was summoned, and upon his urgent request permission was given for a second operation, Dr. Harvey, with several other physicians, being present. It was found necessary to remove the entire large omentum, after breaking up the universal adhesions that were found. The cæcum was firmly adherent, so also were several inches of the ascending colon. The uterus was found in the normal position, firmly fixed as it was at the time of the first operation, with the appendages hidden by plastic exudate, and no attempt

was made to disturb these organs, as it was found impossible even to make an opening through the exudate. There were no adhesions of the small intestine. Thorough irrigation was used, and the abdomen was closed without drainage. The patient sustained but slight shock. Twenty-four hours after the operation, Mrs. G. was convalescing, and her recovery from this on was uneventful. She returned to her home in five weeks, and has never suffered a pain from that day to this. A letter, recently received from her, states that she is entirely well, fleshy, and rosy-cheeked, and the happiest woman in Ohio, where she is now visiting. The appendix vermiformis was not found, but there is no doubt in my mind that there was perforation of this organ at the time of the attack in March.

CASE VI.—RETROFLEXION AND FIXATION OF THE UTERUS; INTESTINAL COMPLICATIONS; LONG INVALIDISM; RECOVERY.

Miss F., aged twenty-seven, by occupation a teacher, came to me with the following history. Her menstruations have always been painful, and during the past few years often confined her to bed for one or two days. In June of this year, Miss F. consulted a lady physician, who at once diagnosed her trouble to be stenosis of the cervical canal, and resorted to daily dilatation as a means of relief. This treatment was given at the doctor's office, and required only a few repetitions to set up an extensive peritonitis, which caused the patient to take her bed. Miss F. was not long in discovering that the treatment she was receiving would soon end her existence, and wisely, or perhaps I might say unwisely, as the sequel will prove, changed physicians. She was immediately informed that the treatment she had received was not at all indicated and was extremely dangerous in character. The treatment recommended and carried out by this gentleman was to daily attempt to replace a retroflexed and fixed uterus, by means of a sound, at the same time that the patient was suffering from peritonitis. This treatment caused such unbearable suffering that on two occasions the patient was anæsthetized. The first operation consisted of complete dilatation of the cervix and an attempt to replace the uterus by the sound, curettement of endometrium and packing the uterine cavity with gauze, also dilatation of the urethra and stretching of the rectum. The rectum was stretched to cure troublesome hemorrhoids. This treatment made the patient very ill, and her friends thought her recovery impossible. Ten days after this operation the doctor made his first examination, and found that the uterus was again retroflexed and more firmly adherent than ever. The patient was again placed under the influence of an anæsthetic, and a second attempt was made to replace the uterus by the use of the sound. How successful this treatment was, I cannot say. The patient, after some weeks of severe illness resulting from the treatment received by both physicians, and only kept alive by the skill of a trained nurse who worked over her night and day, was taken to her home from a hospital, still too ill to leave her bed. In spite of this condition, the doctor thought that he must treat that uterus by some process or other, and, in order to have a change in the programme, he used electricity. Thus the poor girl was tortured, first by one process and then by another, until nature revolted, and the doctor, exhausting his last remedy, permitted her to have the much needed rest by discontinuing his treatment. It required only a very short period of time for nature to come to the rescue, and enable the lady to resume her vocation as a teacher. Under much suffering, often greatly prostrated by weakness, she continued her work for a few weeks before applying to me for my opinion. I found, upon examination, a firmly adherent retroflexed uterus, and a pelvis full of exudate. The abdomen was often as much enlarged as that of a woman in the seventh month of pregnancy. My diagnosis was, chronic salpingitis, peritonitis, and intestinal adhesions. I urged prompt operative interference as the only rational means of relief. A very short incision was first made, to enable me to pass two fingers into the pelvis for diag-

nostic purposes. The omentum was universally adherent to the abdominal and intestinal peritoneum. After severing the adhesions so as to enable me to reach the pelvis, I was somewhat surprised to discover that no uterus or appendages could be found. A small mass could be felt lying on the rectum, which consisted of the uterus and appendages, but so thoroughly veiled that their outline could not be deciphered. I next addressed my attention to the cæcum, as the history pointed to a lesion of this bowel. It was so thoroughly adherent that it required much time and patience to deliver it so that it could be examined; the injury done to the bowel was quite severe, making it necessary to suture a portion of it, and to control hemorrhage by the use of the Paquelin cautery. The consulting physician, an eminent member of the profession, suggested that it was not possible to complete the operation. However, in view of the fact that the patient had not been shocked, my judgment dictated that I should be cowardly not to attempt to remove the cause of her suffering. After long-continued effort, I made an opening through the thick tenacious membrane which veiled the uterus and appendages, and as rapidly as possible removed the right appendage, which was firmly adherent to the cæcum, making it necessary to ligate the distal end. The proximal end of the tube was literally torn from the uterus, so that ligation was impossible. The hemorrhage was profuse and really alarming. The incision had previously been enlarged so that it reached to the umbilicus, thus affording ample room for the manipulation. As rapidly as possible, I severed the adhesions of the left appendage from the bowel and pelvic fascia. Although I succeeded in transfixing and ligating the broad ligament, as is customary, the ovary and tubes were removed in pieces. Both tubes were many times the normal size, indicating long and serious salpingitis. Pus was found in both tubes. Having succeeded in bringing the uterus forward to its normal position and in freeing it of its appendages, I felt certain that my patient would recover without a bad symptom, provided I could control the hemorrhage. After the use of a very large quantity of hot water by irrigation, I packed the pelvis tightly with sterilized iodoform gauze, closed the upper and lower angles of the incision, introduced some provisional sutures, applied a tight bandage over a thick compress, and placed the patient in bed, apparently without shock. The time of the operation was one hour and twenty minutes. The gauze was left *in situ* for forty-eight hours, when it was removed, and a smaller quantity introduced. I then tied the provisional sutures which had been introduced, nearly closing the incision, leaving only enough of opening to permit drainage. Miss F. seemed to convalesce from the hour she was placed in bed, as her pulse and temperature were never above normal. There was a bowel movement within twenty-four hours, without the use of laxatives. The patient's recovery is complete, and I never had a more satisfactory result even in the least complicated cases.

I am impressed, when considering the gravity of this case, with the thought that one's life could not be better spent than in trying to disseminate the fact that the world would be far happier, if every physician would discard the use of the sound or the uterine dilator in the treatment of cases similar to this. Recently, in reviewing her sufferings under the treatment received, Miss F. suggested that in the days of the inquisition, this mode of torture would have taken the place of all others in its severity, had it been known.

CLINICAL LECTURES.

A CASE OF ACROMEGALY; PRESENTING ALSO FLOATING BODIES IN A CYST CONNECTING WITH THE KNEE-JOINT.

CLINICAL LECTURE DELIVERED AT THE BUFFALO GENERAL HOSPITAL, DECEMBER, 1894.

BY ROSWELL PARK, A.M., M.D.,

Professor of Surgery, Medical Department, University of Buffalo.

M. H., aged forty-two, Mayville, New York. Brought by Dr. Prendergast, of Mayville. (Figs. 1 and 2.)

This case presents two features of no little interest, to the most striking of which, however, I will first call your attention. As the man sits here before you, you notice striking peculiarities about his face and hands, which must instantly attract your attention. Remember that he is now forty-two years of age, while he tells me that as a young man he was slight of stature, of about his present height, however, and that he was generally known throughout the country as a good-looking, comely person. The changes which are observed in his case have come on slowly, and he ascribes the first of them to a date about seventeen years ago. He noticed at that time that his hands appeared to be enlarging in size, and his jaw to be increasing in length. Since that time, gradually and painlessly, alterations in his physique have come on which I will describe to you one by one.

Take, first, his facial appearance. You observe the marked prominence of the superciliary ridges, which cover his eyebrows, overhanging them and making his eyes appear more deep-set. His whole forehead presents a massive appearance, although its height is not apparently increased. Contrasted with this, the malar prominences appear relatively small. He has lost his teeth as the result of dental caries, and not from any process connected with this disease. The lower jaw is enormously increased in size and length. He tells me that his teeth used to meet evenly. If now he possessed his natural dentition, the lower teeth would project nearly an inch in front of the upper. The average measurement of the face of a man of his size makes it about nine inches from the tip of the chin to the level of the head. In this instance it is a little over eleven inches. Observe that the increase in size of the lower jaw pertains to all its measurements, and that it is in every respect altogether too large for the face. As the man speaks, you

notice a peculiar nasal twang to his voice, his tones having the same peculiar quality which we notice in young children whose respiratory passages are filled up with adenoid growths. This is due in this instance to a similar enlargement of the turbinate bones within the nose, and to hypertrophy of the mucous membrane covering them, the effect, so far as the tone produced is concerned, being the same.

As we examine the patient's body, note next a peculiar kyphotic curve of the upper dorsal spine. He says that as a young man he was perfectly straight. There has never been any evidence of spinal disease in his case, and this hardly appears to be due to hard work, although the man is a farmer. He attributes it himself, as I would also, to the general condition under consideration. Next, I plant him squarely before you, and you will observe an enormous relative increase in the size of the inner ends of his clavicles, and the upper end of his breast-bone. The clavicles are as thick through their inner ends as my two thickest fingers, while at their outer ends they have the average dimensions. They appear to have elongated somewhat also, since he says his shoulders have spread somewhat. Running my hand up and down over the breast-bone, I detect several cross ridges, which are as firm in their texture, apparently, as the bone at any other part. These also are frequently noted in this condition. The ribs do not display any marked alteration, although their free ends are somewhat enlarged; and in the pelvic bones nothing is discoverable which is characteristic.

Glance now at his hands and feet. Here we discover the most marked evidences of this peculiar disease, in that the extremities of the body are enormously overgrown. There seems to be a nearly symmetrical increase in size of all the constituent parts, bone and soft tissues; while the relative dimensions of the hands and feet are not particularly disturbed, the total increase in size is most marked. His hands have somewhat the appearance of boxing-gloves, and his feet feel to him very large, heavy, and clumsy. The overlying soft parts seem to be a little more cedematous than is natural, and yet it is hard to say that the soft tissues are disproportionately overgrown. When, now, we ask the man about his general condition, he says that he feels perfectly well; that if he complains of any particular discomfort at all, it is of occasional headache. His mind seems perfectly clear, and his digestion and excretions are apparently normal. He is the father of four children, the youngest being four years of age. So far none of them present any peculiar characteristics.

What, now, is this condition which has given this patient these peculiar appearances? It is known as "acromegaly,"—a word derived from two Greek words meaning "giant extremities" or "enlarged extremities." This is one of the new diseases, which you will not find even mentioned in any of the older text-books. The first to write upon this subject was Dr. Marie, who was at that time first assistant in Charcot's clinic. Marie's first essay was published in 1885, and since that time a number of cases have



FIG. 1.—Dr. Park's case of acromegaly,
anterior view.



FIG. 2.—Side view.



FIG. 3.—Extremities in a case of elephantiasis.



FIG. 4.—Posterior view.

been reported under various titles, some of which, not so called, were really acromegaly, while some reported under that name do not deserve the title. There are now something over a hundred cases on record.

It is characteristic of this disease that all the projecting portions of the body are enlarged, or, at least, that all of them sometimes are, and that many of them are in every typical case. The hands and feet, bones, cartilages, and soft tissues are alike hypertrophied. There is also usually progressive increase in weight. The lower jaw enlarges to such an extent that extreme prognathism is present. The bones of the upper jaw are but little, if at all, affected. The supra-orbital ridges are enlarged, as in this case. The cartilages about the face—namely, those of the eyelids, nose, and ears—are often involved, but here very slightly. Most characteristic also is it that the sternal ends of the clavicles and of the costal cartilages should be enlarged. Sometimes the ribs are widened, and sometimes the scapulæ are enlarged. Here they seem to be but slightly affected. Sooner or later the vertebræ and the cartilages of the spine become involved, the latter thickening and ossifying, and causing such deformity as you see here. While the long bones of the limbs are but slightly affected, except at the lowermost joint ends, there has been sufficient alteration in the internal condyle of each femur to throw the knees somewhat outward and make him somewhat bow-legged. The viscera are seldom affected. Sometimes there is more or less alteration of kidney function. Pain in the head is a very frequent complaint, cephalalgia being often most severe. Peculiar disturbances of sensation are met with occasionally in the fingers; but sensibility is fairly well preserved. Special senses are not involved. The voice is often made coarser and deeper. Sometimes the mind is impaired and the memory poor; but this is not the case with our patient. Here, as usual, the skin is coarse and rough, and there has been a marked increase in the hair all over the body. Joint pains are often complained of, but not in this instance. Family history seldom sheds any light upon these cases, nor does it here. The facial appearances are not entirely due to the bony hypertrophy spoken of above, but partly to the fact that the skin is thrown into transverse folds, is coarser, and that the eyebrows and eyelashes, as well as the beard, tend to grow excessively. The teeth seem to participate rarely in the changes produced by this disease, although as the jaw grows and the alveolar process with it, the teeth are sometimes separated by continually increasing intervals. This patient lost his teeth some years ago; consequently, we can learn nothing in this regard from this case. Although the mucous membrane of the nose is almost always hypertrophied, still the sense of smell is very rarely interfered with. Sometimes the tongue participates in the overgrowth, while its massiveness gives an expression of weight and clumsiness during speech. The uvula also, like other extremities, may be enlarged. Sometimes the laryngeal cartilages and vocal cords participate as well; but in this case they do not seem to. The thyroid body almost always varies from the normal, but not in any regular or distinctive

way. Sometimes it is enlarged, sometimes cystic, sometimes atrophied to complete disappearance, but it is seldom normal. This man shows a very marked increase in the circumference of the chest, of which he is himself very conscious. The occurrence of the transverse ridges on the sternum is largely due to irregular growth of the sternal segments, and seems to be peculiar to this disease. Behind the sternum there will sometimes be found a considerable area of dulness, which is, in at least some cases, due to enlargement of the thymus body. The dulness may also be due to the thickening of the bone. The ends of the fingers appear usually to enlarge from the nails, and the latter may be overlaid by redundant flesh. Upon the nails there are commonly noted well-marked longitudinal striations, while the nails themselves are usually brittle.

Acromegaly is essentially a symmetrical disease, and, in almost every case, for every change on one side of the body we notice a corresponding disturbance on the other. The cases in which it is recorded that one side of the body was larger than the other are relatively rare. Nevertheless, typical cases may be observed.

A few cases are characterized by remarkable overgrowth of muscle; but this usually subsides later, so that the muscles are finally atrophied in greater or less degree with corresponding diminution of muscle power. Under the peculiar conditions which cause this disease, there seems to be stimulus to the growth of hair all over the body. Pigmentations in various areas of the skin have been noted in many cases. Several recorded cases also show molluscous growths, noted most often upon the face and especially about the eyelids. Multiple fibromata of the skin have been noted not a few times.

In those parts most involved in the overgrowth, such vaso-motor disturbances as tingling, flushing, and local sweating are not infrequently observed. Exophthalmos has been noted, due either to real enlargement of the eyeballs or to bony growth within the orbits. In particular cases various visual disturbances have been described. Somnolence has been noted in quite a proportion of the recorded cases; vertigo less often.

We come now to the natural inquiry, What is the pathological condition underlying all these alterations in the normal rate of growth? Of all the lesions noticed in the various organs which could in any way influence growth, that which has been found most constantly is a marked increase in the size of the pituitary body. This, you know, is often spoken of as the hypophysis of the brain, is connected to it by the infundibulum, and is itself located in the sella Turcica. It is worth while just here to remember that the bony cavity in which this body rests enlarges its dimensions under these circumstances to accommodate the growing hypophysis, and, in the skulls of individuals dying of this disease, the clinoid processes are much wider apart and the sella Turcica much deeper than in the normal skeleton.

We ask next, What is the peculiar relation between the enlargement of the hypophysis and this peculiar condition? I have to acknowledge that

for this there is as yet no explanation. Recall, however, the peculiar structure of the pituitary body, and you will remember that it deserves to be ranked rather with the thyroid, the thymus, the adrenals or suprarenal capsules, and perhaps with bone marrow, than with anything pertaining to the bone proper. Similarly, although it contains some peculiar nervous elements, it is by no means a nervous ganglion, nor an inherent part of the brain proper. If the function of all these tissues and organs just mentioned be inquired into, it will be found that in some way they all have to do with nutrition, and with the elaboration or disposition of products of digestion or of assimilation. This is hardly the place in which to discuss, for instance, the function of the thyroid, even could one tell positively just what work this body performs; but, if we say that these tissues, which have more or less histological resemblance, are in some way concerned with the elaboration of nutritive material, or the excretion of the results of nutrition, we cover the ground, perhaps, sufficiently well for present purposes. Underlying the condition of acromegaly must be found perverted nutritional changes, and we perhaps go as far into its pathology as we satisfactorily can go at present, by saying that it is quite probable that these alterations are a consequence of preceding alterations in one or more of the structures just mentioned. When we seek, however, for the causes concerned in the production of these changes, we are at present absolutely in the dark.

In a recent very instructive lecture, published by Dr. Solomon Solis-Cohen (*International Clinics*, 4th Series, vol. ii., 1894, p. 68), there is a very attractive epitome of some of the recent teachings with regard to the pathology of the thyroid body. Take, for instance, the following conditions: myxœdema, rheumatoid arthritis, cretinism, diabetes mellitus, exophthalmic goitre, and acromegaly, and we shall see that in all of them there are certain phenomena which are more or less constant and interchangeable. There are, for instance, changes in the skin and hair, impaired mental power, joint lesions, nutritional abnormalities, deformities, polyuria, and glycosuria not depending on pancreatic lesions, vaso-motor disturbances, with disorders of vision and often of other special senses. In at least three of these conditions,—namely, the first, third, and fifth,—the thyroid is known to figure very largely. The pathology of the second, which is certainly misnamed, is uncertain; the fourth depends upon various causes, and may occur without the lesions which I am here speaking of, while the sixth—that is, the subject of our present talk—is in many respects closely related to the others. I would not care to be quoted as saying that all of these conditions depend upon thyroidal alterations, but I do think that it is now perfectly safe to assume that an explanation for all of them is to be met with in some of those vague conditions, known at present by their results, whose explanation is probably to be found in failure or excess of action on the part of the special tissues or organs previously mentioned. This is a most promising field for study, although a difficult one, and is one

in which knowledge comes to us only slowly and as the result of most painstaking investigation.

It is also of importance to remember that the pituitary body, one of these structures of unknown purpose, is developed, in the embryo, from the alimentary tract.

It is enough, then, to confess our ignorance in this respect, and to pass on to the discussion of other features suggested by this case, stopping only to remark that theoretical consideration of cause and effect might lead one to the suggestion that it would be well to remove this pituitary body, if it could be made accessible. Without professing too exactly to what limits operative surgery of the cranium may permit us to go, I can only say that, so far at least, this operation seems at least impracticable, if not impossible, although it was attempted in at least one instance within a short time by an English surgeon, who, however, had to abandon his attempt. As the result of relief from pressure which his operation afforded, considerable temporary improvement was manifested.

In various cases which have been carefully studied and reported, observers have found other pathological lesions of different parts of the body, but none which are so constant and none so suggestive as those above alluded to.

Diagnosis.—The principal conditions from which this case before you must be differentiated are gigantism, elephantiasis, leontiasis, and arthritis deformans. Let us take these in order. *Gigantism*, or giant growth, is a condition whose etiology is perhaps even more obscure, in which there is symmetrical and general enlargement all over the body. While the cranium and face may develop to a surprising degree, there is no disproportion between the two, and the body keeps pace with the size of the head. The bone ends are not enlarged out of proportion, but all the dimensions of a given bone are increased,—that is, they grow in length as well as in thickness. The lower jaw is not disproportionately enlarged; we do not have the peculiar increase in the size of the nose, tongue, and ears, nor do we have any nervous phenomena. The hand and foot may be large, but they are not disproportionately large. Virchow calls attention to the fact that normally the body is six times as long as the foot. In this case this proportion is decreased. In gigantism the height is more than six times the length of the foot. Acromegaly involves the extremities of the bones, and not their shafts.

It is, of course, to be remembered that gigantism, as was described by Busch (*Langenbeck's Archiv*, vol. vii. p. 174), may be either total or partial. It may also be virtually congenital; whereas acromegaly is always an acquired condition, coming on somewhat late in life. I submit to you herewith some reproductions from illustrations in various works to which you may have little or no access, which illustrate some of these different conditions, and will ask you to contrast them with yet other illustrations which I will show you, illustrating different yet similar conditions. Gigantism

FIG. 5.

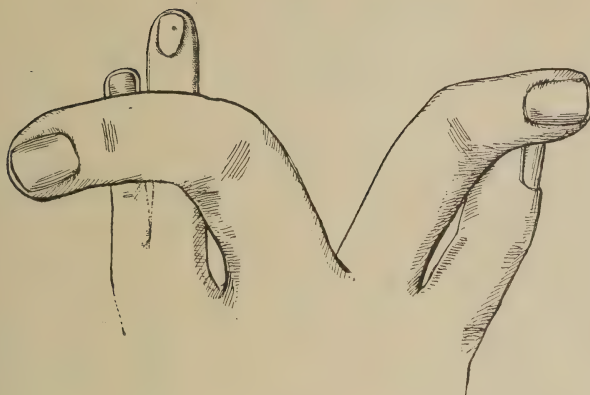


FIG. 6.



FIG. 7.

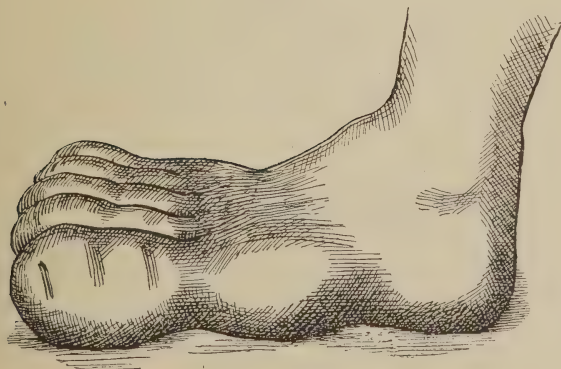


FIG. 9.



FIG. 8.



FIG. 10.



FIG. 11.



which involves one extremity, as it may sometimes seem to do, is stated to often involve at least the entire half of the body in the course of time. On the other hand, there is a variety of gigantism which concerns especially the fingers and toes, which seems to proceed to a certain degree and then remain stationary. (See Figs. 5-7.)

Just here I want to invite your attention for a moment to the difference between acquired gigantism, particularly of the fingers and toes, and another condition of congenital gigantism where, either after or before birth, there is a relatively disproportionate, sometimes enormous, overgrowth of perhaps one finger or two, perhaps of a limited portion of a hand or foot, or possibly of a part of one of the limbs. (See Figs. 8-11.) The best collection of specimens of this kind that I know of is in the College of Surgeons in London; but a few illustrations of the condition I am able to present to you now.

The condition of genuine gigantism is also not to be confused with what has been sometimes called "spurious gigantism," which is essentially a lipomatosis of an entire limb or part of the body, sometimes combined with, sometimes almost independent of, other distortions of the skeleton. This condition is also spoken of sometimes as "*diffuse lipoma*."

Let us next distinguish between acromegaly and *elephantiasis*. Of the latter it may be said that it is a curious condition of hypertrophy, mainly of the skin and subcutaneous tissue, frequently confined to one part of the body, occasionally met with in two extremities or about the genitals, rarely involving the head or the upper extremities. The Buffalo Academy of Medicine has in its collection a hand enlarged by this condition, which is perhaps much larger than one of this man's hands. It belonged to a young man who was an inmate of the penitentiary for a long time, in whose case absolutely no cause could be found, and who permitted it to be amputated because it was so useless and so troublesome. In tropical countries elephantiasis is in large measure due to the presence of a peculiar parasite in the blood, whose effect seems to be to irritate and to cause proliferation. The cases which are met with in our latitudes are rare, and are almost always due to some other cause, lacking, so far as we have been able to discover, any elements of parasitic irritation. I show you herewith (Figs. 3 and 4) photographs of the extremities of a woman, who lives in an adjoining town, both of which are enormously overgrown, and yet I doubt if she has ever been outside of Erie County. You will remember that a year or two ago I tied the femoral artery as a sort of forlorn hope in one case of this kind, and it had been my hope to present to you another illustration of elephantiasis, extremely typical in its way, in the case of an old woman, one of whose legs was involved to such an extent that the circumference just below the knee was about forty-four inches. Her leg was literally almost as large as a water-pail. She came in here a few weeks ago for the purpose of having the limb amputated, but delayed her coming until on entrance she was extremely weak, septic infection having occurred from

pressure ulcerations upon some of the hypertrophied parts; and, in spite of all that could be done to strengthen and tone her up, she continued to sink and died of combined sepsis and exhaustion, a victim to her own delay.

These cases of elephantiasis, as we see them in this clinic, are for the most part due to either congenital or acquired alterations in the lymph-vessels of the part involved, by which we have both stasis and dilatation of lymph-channels, and, in one or two cases that I have seen here, actual lymphorrhœa.

The enlargement in elephantiasis pertains entirely to the soft tissues, at least at first, although it may be possible to have later some enlargement of the bone in consequence of more nutrition going to the part. In the hypertrophied skin great folds and fissures form, and ulceration is a very common accompaniment. I have not seen this noted in any case of acromegaly. Finally, in elephantiasis there are no nervous phenomena of any kind.

Virchow and other pathologists have described a so-called *leontiasis*, which pertains especially to the face and cranium, particularly the latter. In some of these cases there is an almost equable hypertrophy of the cranial bones to an enormous extent; in other cases the hypertrophy is more or less local, and the consequence is development of bony tumors, irregular in shape and distribution, with consequent great deformity and asymmetry. In these cases the lower jaw is not enlarged, and there is no alteration whatever in the bony skeleton of other parts. Consequently, there is no excuse for confusion between this condition and acromegaly.

A number of years ago Paget gave a very complete description of a somewhat rare condition of the bony skeleton, which he named "*ostitis deformans*." Let us speak but briefly of this, and say only that it has not been known to occur under the fortieth year of life, nor usually after fifty, that the long bones are those first affected, and that rarely do the feet and hands show any alteration; that these long bones are altered in shape, especially in natural direction, so that they become more or less curved, producing sometimes great deformity; that the disease is not symmetrical, one limb or bone being affected before another; that, while the cranium may suffer, the facial bones scarcely ever do; and that the facial appearance is the reverse of that presented by this patient, the lower part of the face being narrow, and the apex of the jaw being the apex of a triangle whose base is formed by the cranium.

Another somewhat similar condition is that of *arthritis deformans*, in which, however, the principal change is in the articular tissues, which is accompanied by great pain, with later deformity, and perhaps ankylosis. The muscles in the neighborhood of these affected joints atrophy, and sometimes contain tender nodules. The disease is symmetrical usually, and may in time involve all the joints of the body. The joints of the hand, for instance, may enlarge; but there is such complete atrophy of the soft parts that the picture presented is very different from that which we see in this man's hand. As the joints become involved they also become stiffened,

whereas this man has perfect control of all the natural movements of his hand. About the only point of resemblance between acromegaly and arthritis deformans is in the occasional development in the former and the almost constant presence in the latter of osteophytic or cartilaginous outgrowths about the joints.

One must not forget, also, that it might be easy to mistake on casual examination a case of acromegaly for one of *myxœdema*. This latter condition is characterized by increase of subcutaneous fat and connective tissue, and by mucoid softening of deposits in the skin as well as in some of the viscera, its most marked lesions, however, being presented by the thyroid body and the sympathetic nerves. The extremities of the body become more or less enlarged and clumsy, and there is impairment of the mental faculties, as well as of special senses, with swelling of the face, tongue, and neck, including the larynx; but there are no alterations which are characteristic in the osseous skeleton. Four-fifths of the cases of *myxœdema* occur in women, most frequently between the ages of forty and fifty. Sir William Gull has described the face under these circumstances as having a "full-moon" appearance. The ends of the fingers may be somewhat swollen and club-shaped, although the bones themselves are not enlarged. The appearance of the skin is distinctive, it being peculiarly pale, having a waxy appearance, being also puffy, even boggy, and almost always shiny.

Two other conditions, quite rare, with which acromegaly might possibly be confused are, first, another condition described by Marie, who has written the best monograph on acromegaly, which he has named "*osteo-arthropathie hypertrophiante pneumique*." This is, in effect, a disease of the lungs, accompanied by enlargement of the extremities. The lung affection may be empyemic or neoplastic, and there is some reason to think that, whatever it is, there is present some micro-organism giving rise to products that are absorbed into the general circulation, the result of whose presence is an irritative hypertrophy of certain parts, particularly the joints and the ends of the fingers, the elbow, shoulder, and knee-joints, sometimes the wrist. We get also occasionally dorso-lumbar kyphosis, which in acromegaly is usually cervico-dorsal, and we get sometimes more or less diffuse enlargement of the various other bones of the body.

The other condition has been quite recently described by Dr. Dercum, of Philadelphia (*Am. Jour. Med. Sci.*, November, 1892), he giving it the name of "*adiposis dolorosa*." In these cases there is an enormous growth of fat, sometimes limited, sometimes spread all over the body, this condition differing from that of general lipomatosis, already spoken of, in its rarity, in the mental symptoms, in the headache and the generally painful condition complained of, and also, in the cases examined by Dr. Dercum, in certain alterations in the thyroid body.

What more is to be said about our case? Naturally, you desire to know what his prospects are, and what, if anything, can be done for him. So far as the prognosis of acromegaly is concerned, it is unfavorable. Marie

estimated the duration of the disease to be from ten to twenty years. Our case has already gone on for fifteen or sixteen years, and he seems to be in excellent general health. The disease, however, is continuously progressive, particularly those features which pertain to the osseous system, although in other cases there do occur periods of apparent cessation of symptoms, alternating with resumption of growth. In almost all the recorded instances, however, patients have fallen gradually into a cachectic condition, losing slowly their muscular power, taking finally to bed, and for the most part dying of exhaustion. In some instances headache has become gradually so severe as to produce temporary insanity, with often suicidal tendency, this headache probably being due to increase in size of the pituitary body.

In the way of treatment, we may ameliorate certain symptoms, but the disease must for the present remain incurable. Under the influence of rest alone many cases seem to be improved. Individual symptoms should be treated as they arise; the excretions should be carefully regulated; and when mastication becomes impracticable, as it does after a while, owing to the prognathism, pre-digested or easily swallowed food must be given. It has been suggested to use arsenic in large doses. It is well worth a trial in these instances, but not very much is to be hoped for from it. Finally, as already remarked, it occurred to one of the English surgeons, a year or more ago, to endeavor to expose the pituitary body in a case which was suffering extremely from its enlargement. Owing to the serious condition of the patient, he was unable to accomplish his purpose completely, but, as the result of a large opening in the cranium and the consequent relief of the pain, there was great improvement, which lasted more than a sufficient length of time to amply justify what had been done. (*Brit. Med. Jour.*, December, 1893, p. 1421. Report by Caton and Paul.)

So much for the peculiar and most interesting features of this case of acromegaly. There is, however, another and apparently an absolutely separate and distinct lesion in his case, which, indeed, is the reason of his presenting himself here. Posteriorly, in the right popliteal space is a tumor, which, underneath the skin, seems to be the size of a hen's egg. It fluctuates, and evidently contains fluid; its outer surface is not far removed from the skin; it is not adherent to the overlying parts, and seems to be a thick-walled cyst of some kind, which has probably sprung from the deeper structures. It has been present for some years, but he says is slowly increasing in size, and now makes his knee feel uncomfortable enough, so that he seeks relief by its removal, if considered best. This may be a cystic tumor of congenital origin, which has comparatively late in life begun to grow; it may be a hygroma from some of the tendon sheaths; it may be a hernial protrusion from the capsule of the knee-joint; or it may be some cyst of at present unknown origin. But, whatever it may be, it seems to me one which it is quite justifiable to attack and remove.

As I cut down upon it, the patient being now properly anæsthetized and prepared, you see exposed a cyst, whose wall is thick and glistening,

being apparently composed of quite firm fibrous tissue. It separates without great difficulty from the parts around; and, as I proceed with this separation, I find my finger approaching nearer and nearer the ordinary limits of the joint. Finally, holding the popliteal vessels to one side—they being not exposed to sight, but not far from the finger—and retracting the tissues on the other side, I am able to both see and feel that this tumor leads down to, and is at least adherent with, the capsule of the joint, if it does not open into it. The more I endeavor to separate at this point, the more I discover that they are practically one, and that the cystic tumor is simply a hernial protrusion, of long duration, from the joint proper. Accordingly, I will discontinue attempts to separate, and with blunt scissors will cut it off, not quite even with the capsule, but a little farther away, so that with sutures I can completely close the opening into the joint thus made. As I do this you see a quantity of thick, glairy synovial fluid escape; and now, to your surprise, and I confess to mine, there pop out five of these solid masses, three of which are as large as cherries, the other two being still larger. They have been contained within this sac, in which they have either formed, or into which they have escaped from the joint proper. Let me first close the deep opening with buried catgut sutures, and then bring the parts above together at once, in order that the wound may be dressed, and then we will discuss the character of these concretions.

On handling them they are quite firm and dense, spherical in their general shape, nevertheless irregular and nodulated. We will cut one through, and we find that its consistence is homogeneous, and that, in all probability, it consists of condensed fibrin.

What now is the origin of these bodies? Such concretions are often met with in joints, particularly in the knee-joint; and to such the Germans have given the very suggestive name of “*gelenkmaus*,” or “joint mouse,” alluding to the facility with which they slip here and there from one side of the joint to the other, and sometimes shift position to recesses within the complicated joint where they cannot be detected. Ordinarily, for our purpose, we will speak of them as “floating bodies.” Their presence in this place is difficult to explain, although it is not at all unlikely that the sac resulted from an original pocket, in which one or more of these had at first made its home. Were there any history of characteristic trouble such as these little masses cause, I should feel confident that this was the explanation. In its absence, however, though I have questioned the man closely, I am in doubt, and prefer not to commit myself, simply saying that such an explanation is plausible.

If I remember aright, the earliest mention of these bodies was by Ambrose Paré, some three hundred and fifty years or so ago. For many years after his time they were spoken of as loose cartilages; but, on more accurate study, it was found that they were not always cartilaginous, but were sometimes fatty or fibrinous, and sometimes even bony. In fact, occasionally they are found to consist, at least in part, of true bone,—that

is, they have lacunæ and canaliculæ, although Haversian canals are never found.

These bodies are found much oftener in the knee than in all the other joints put together. As illustrating the advance which has been made in surgery during the past twenty years, I may remind you that under the old *régime* their removal was considered a matter of the gravest import, and was often followed by septic disturbance and death; in fact, the mortality rate, after what is ordinarily now a minor operation, used to be fearful. In shape they are sometimes flattened and sometimes globular, or mulberry-like. It has been suggested that,—

1. They have been produced by the synovial fringes, one or several of which may have undergone hypertrophy and tissue alteration.

2. Also that there has been tissue outgrowth from some point upon the synovial expanse.

3. That they are really periosteal tumors, which have formed at the cartilage edges.

4. That they are direct outgrowths from the cartilages.

5. That they result from fibrin or blood which has been poured out within the joint.

6. That they represent pieces of normal structure, which have been detached by attrition.

That so many explanations for their presence have been offered is of itself proof that they are not always of the same origin. You will remember that, the other day, I opened an elbow-joint and evacuated from it a large number of so-called rice-grain bodies. For them I gave you the explanation that they represented an original fibrinous exudate into the joint at the time of the injury, of which we got a history, and that they were gradually produced by absorption of the fluid part of the sero-fibrinous exudate, by the deposition of the more solid fibrinous portion, and that then, as joint movements were resumed, this fibrinous layer became rubbed away at places, and that the masses represent the fragments of this membrane which had become smoothed and rounded by constant attrition. If, now, that can occur in the elbow, something similar can occur in the knee, although it is probable that something more than that is required in order to produce bodies of the size and density of these. The etiology, then, of "joint mice" is very obscure. Frequently we get a history of injury, in fact so frequently that it is hard not to hold that, in at least some of these cases, the floating masses represent chips from some joint surface. On the other hand, we must remember that similar bodies have been found in the peritoneal cavity and even in the tunica vaginalis testis, where, indeed, even cartilaginous plates have been discovered, but where there could be no question of separation of tissues by accident. I am not unmindful of the fact that good pathologists have maintained that the small rice bodies, also known as "*corpora oryzoidea*," are not of fibrinous origin, but are portions of synovial membrane which have undergone coagulation necrosis or fibrin-

ous degeneration. Still, I think that such explanations do not cover all cases any more than those which have been already offered you. It is a known fact that sometimes these concretions attain a relatively very large size, even that of a hen's egg or larger. In exceptional cases small foreign bodies like needle-points, broken-off villi, blood-clots, and so on, have been found to be the nuclei of such concretions, just as many vesical calculi have nuclei.

Again, there is no doubt that small masses of the bony or cartilaginous articular bone-ends may be separated, or that osteophytic outgrowths, such as are found occasionally about joints, may be broken off,—in either case, of course, by accident. These will be smoothed and rounded in time by attrition, and may increase in size by deposition of fibrin. It is known that we occasionally find such masses only partially detached; and, again, small fragments of bone have been found torn away from points of ligamentous insertion. Again, a peculiar condition of the articular ends of long bones has been described, to which the name "*osteochondritis desiccans*" has been given, which includes some peculiar changes about these parts.

It is known too that, especially in chronic joint diseases, like arthritis deformans or chronic hydrarthrus, we get overgrowth of one or more of the peculiar tissues which make up joints, some fragment of which, after having enlarged, becomes detached, either by accident or by an atrophic process at its base. In fact, in this particular instance we know that the knee-joints have undergone some change as the result of his acromegaly, and it is possible that the secret of these bodies in his case may be found in his peculiar condition. Occasionally, too, the fat contained within a joint, especially the knee-joint, undergoes more or less extensive growth, and gives rise to the condition known as "*lipoma arborescens*,"—that is, lipoma of the villi in the knee, which enlargements may later become detached and float freely in the joint.

There were no symptoms in his case peculiar to this condition, and the case before us hardly suggests a discussion of the treatment. Nevertheless, let me remind you that the symptoms caused by "joint mice" are usually severe pain and functional disability, the pain being of that peculiar sickening character which makes many sensitive patients faint promptly. In some of these cases the patients have learned to make some peculiar motion or to handle the joint in some peculiar way, by which the floating body is moved from the position in which it has caused such instantaneous interference with function, and pain and disability are promptly relieved. Patients who have long had this condition usually have detected for themselves the presence of some such concretion, and are frequently able to call attention to it, perhaps even to indicate the manoeuvre by which it can be driven to some one recess of the joint where its presence can be made absolutely known.

So far as the treatment is concerned, when these bodies give rise to disturbance they are to be removed by small incision, although if one is absolutely aseptic in his manipulations he need not strive to make this removal

subcutaneously, but may open the joint sufficiently to explore it thoroughly, and may remove perhaps not one but several of these bodies, after which the opening may be closed completely without drainage, the limb kept at rest for a week or ten days, and then gradual resumption of its use be allowed.

REVIEW OF MEDICINE.

MEDICINE.

IN CHARGE OF JOHN H. MUSSER, M.D.,

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AND

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Cardicentesis, with Successful Result. (*Edinburgh Medical Journal*, February, 1895.) By Allen Thompson Sloan, M.D.

The patient, a female, aged nineteen, was seized with a severe attack of facial erysipelas which was arrested under treatment, and apparently rapid recovery was about to ensue when suddenly a severe attack of rheumatic fever developed. There was a marked family predisposition to rheumatism, and the patient had previously suffered from three attacks of rheumatic fever, the third of which was accompanied by a mitral systolic murmur, which, however, had cleared up. In this, the fourth attack, the temperature reached 103° F. and nothing gave relief from the pain except Dover's powder. Seven days after the commencement of this attack of rheumatic fever a pericarditis developed and disappeared in five days under appropriate treatment. In six days the pericardial friction returned and, in addition, a well-marked mitral systolic murmur was heard. Following the appearance of these signs there was a rapid pericardial effusion developed, and the patient was so ill that tapping the pericardium was not justified. In nine days from the development of the pericardial effusion the heart had ceased beating, and the patient was practically dead, when the trocar was thrust, as it was supposed, into the pericardial sac, and ten ounces of pure blood were withdrawn, the trocar having entered the right ventricle accidentally. After the withdrawal of the blood the heart, which had previously ceased beating, commenced to contract again, and the patient finally recovered, and six months later was well. The cardiac murmur had entirely disappeared. Puncture of the heart by a sharp-pointed body does not always prove fatal. It was formerly believed that all wounds of this

organ were necessarily and instantly mortal; but cases are on record where, after most extensive injury to the cavities of the heart, life was prolonged for a considerable period and even recovery is claimed to have taken place. In this case, had any blood escaped into the already too full pericardium, death would only have been made more certain. Bleeding from any vein would have been useless, as the action would have been too slow, valuable time would have been lost, and the direct stimulation of the heart by the introduction of the needle unavailable. The practical question is, if cardiac tapping can be done successfully by accident, are there any cases where it should be tried as a deliberate remedy? And the answer must be in the affirmative. In all cases of asphyxia when the heart's action has been stopped,—thus, in cases of suffocation by drowning, accidental hanging, carbonic acid, carbonic oxide, coal gas, or sulphuretted hydrogen, and in cases of still-birth; in cases of chloroform asphyxia; in some cases of heart affection, of pneumonia, and even of bronchitis; when all other means have failed and the patient is evidently dying of engorgement of the right side of the heart, a possible chance of saving life might be lost were cardiac aspiration not attempted.

The First Symptom of Pulmonary Tuberculosis and its Detection by the Fever Thermometer. (*Medical Record*, May 4, 1894.) By Charles Wilson Ingraham, M.D., of Binghamton, N. Y.

As a diagnostic instrument the fever thermometer approaches more nearly the zenith of its perfection and utility in cases of suspected tuberculosis. From close observation in a large number of cases I feel sustained in the assertion that a rise of temperature of from one-half to one degree at some period of greater or less duration every twenty-four hours may be regarded as the first symptom of pulmonary tuberculosis. I believe that this rise of temperature, as a rule, occurs previous to every other symptom, except when tuberculosis follows in the wake of some acute disease without intervening recovery of health. At the very beginning of tubercular involvement, with the formation of the first tubercular nodules, is the most promising period to successfully treat the disease. At this stage the patient raises no infected sputum, which excludes the use of the microscope. The physician is not justified in deciding positively that a disease is non-tubercular until he has before him a complete record of the patient's temperature showing no recurring daily elevation for a period of two weeks. An elevation of one-half a degree occurring daily at some time in the afternoon or evening should cause a strong suspicion of tuberculosis. An elevation of one degree during a similar period will justify a positive diagnosis of pulmonary tuberculosis, and this diagnosis will in ninety per cent. of cases be confirmed by microscopic examination at a later period. With a fever thermometer and a microscope in our possession, and by intelligent use of the same, we are in a position to render tubercular subjects a most accurate and scientific diagnosis.

Medical Septicæmia. (*Medicine*, April, 1895.) By W. S. Christopher, M.D., of Chicago.

Considering clinical and experimental evidence, it is probably not too much to assert that there yet remains a great group of undifferentiated fevers; undifferentiated because, upon the one hand, their specific causes are unknown, and, upon the other hand, because they present no striking clinical peculiarities which would serve to classify them. It seems proper to include these anomalous, undifferentiated fevers under some generic term. The word septicæmia, now in general use, covers the ground; but since it is a term having a distinct surgical flavor and since it carries with it the idea of traumatism, it seems wise to add the prefix "medical," to distinguish a group of cases in which the mode of infection is not traumatic in the ordinary acceptation of the word. The autogenetic fevers and fevers of toxic origin must be excluded from the septicæmias. The author reports a case, which terminated fatally, having dysenteric symptoms, but with no ascribable cause for these symptoms. A second case is reported beginning with bowel trouble, which showed several exacerbations, and which was associated with an erratic temperature; this was followed by peritonitis and pneumonia with recovery. This case was not typhoid; nor could it be assigned to any recognized disease. A third case began with nocturnal delusions, accompanied by slight fever and followed by pneumonia. A fourth case presented a high temperature with a pneumonic consolidation which cleared up in three days. A fifth case began with diarrhœa and emaciation following vicious feeding, which improved after the institution of proper diet and treatment. Later there were convulsions and an excessively high temperature, the thermometer registering 111° F. before death. In these cases, although there was morphologically a nameable disease present, yet clinically that disease was not present, and it is for such cases that this group is suggested with a name sufficiently comprehensive to include them all. Morphology has done much for medicine in the past; but the trend of medical thought to-day is beyond morphology to etiology. It is not enough to know that pneumonia is present; but something as definite as possible of its etiology in each case must be known. If the febrile processes which are as yet undifferentiated clinically are recognized under some generic term, it will avoid forcibly classifying under specific names processes having more or less resemblance to those of the name adopted, and it will afford great assistance in the recognition of mixed infections.

Observations on Cholera in India. (*Indian Medico-Chirurgical Review*, February, 1895.) By E. H. Hankin, M.A.

In a European town there are, commonly, only two or three sources of water in use. In an Indian town, on the contrary, there are hundreds of distinct sources. In Cawnpore there is a well in nearly every house. This peculiarity complicates the questions connected with the distribution of

cases in a cholera epidemic. When cholera is prevalent in a town, it is a rule that isolated cases occur among the troops in the neighboring cantonment. The source of infection may be from the breaking of quarantine regulations by the soldiers, or the infection may be brought in with the food. The food is probably infected through the agency of flies. In India shallow surface drains exist in every street, and these drains, at the time of an epidemic, contain cholera dejecta with very little other liquid to dilute them. Everywhere in such a town millions of flies settle on the filth in the drains and then, in hundreds, on the food displayed in the shops. Cholera began in Cawnpore in May; the epidemic showed a great exacerbation after the rains had set in, and ceased entirely after they were over. This rise and fall of the disease is readily explained. When the cholera infection first reaches a town in hot weather, it is limited for its means of propagation to the well-water. The microbes exposed in the street drains are quickly killed by the heat and dryness of the air. As soon as the rains commence the surface of the ground is moistened, the rate of evaporation is diminished, and, as the sky is usually cloudy, the bactericidal influence of sunlight is removed. Now, too, the flies travel out of doors all day. For these reasons the cholera microbes have better chances of existing in the streets and of finding their way to food, clothing, etc. After the first rain there may be a temporary cessation in the epidemic from the washing of the streets. Microbes resembling that of cholera are extremely rarely to be found except in the two or three months after a cholera epidemic. During the epidemic these organisms give the indol reaction and possess other characteristics regarded as typical of the cholera microbe. After the cessation of the epidemic, these microbes show a greatly diminished virulence for guinea-pigs, and other evidences of a diminished vitality. The vibrios found in well-water after a cholera epidemic are nothing more than the microbes of cholera in a degenerated condition. At the *Koombh Mela*, at Allahabad, two million pilgrims visited the bathing *ghat* in one day. There had been no cholera in or near Allahabad for a long time before; but examination of sixty samples of water showed vibrios in eleven. After this *mela* cholera broke out in Allahabad and the neighborhood. At this time the vibrios were searched for in sixteen specimens of water, including the eleven in which they had previously been found; but they had disappeared from all but two of the samples. This seems to be an indication of the rule that the cholera microbe degenerates rapidly when it gets into well-water, and under ordinary conditions loses its virulence in about eight days. Though there is reason for thinking that the cholera microbe degenerates rapidly in well-water, there is no reason for thinking that it degenerates in water that contains a sufficient amount of food materials.

Morning Diarrhœa. (*Medical Record*, May 11, 1895.) By Francis Delafield, M.D., of New York.

The term "morning diarrhœa" is applied to a group of cases seen in

patients who have one or more loose passages of fluid and fæcal matter from the bowels during the morning hours. This condition is not fatal and the lesions can only be surmised from the symptoms. The lesions thus suspected are located in the colon, and consist of an exudation of serum from the blood-vessels, a morbid change in the functions of the mucus-producing glands, a productive inflammation in some cases, and no structural change in others. There are no satisfactory reasons for the occurrence of the diarrhœa. The discharges from the bowels are of large size, brownish in color, and are composed of fluid mixed with fæces. They may be offensive and are frequently accompanied by the escape of wind. Five varieties are mentioned: first, those in which there is a single loose movement every morning after breakfast; second, those in which there are several loose movements after breakfast; third, those in which the loose passages commence at four or five o'clock in the morning; fourth, those in which a movement of the bowels always follows the taking of food; and fifth, those in which mucus is occasionally present in the discharges. The third, fourth, and fifth varieties result from the persistence of the first two and are extremely annoying. The cases may be benefited by change of climate or by the adoption of a restricted diet. The drug which has given the best results is castor oil in doses of from five to ten drops.

A Case of Addison's Disease. (*Quarterly Medical Journal*, October, 1894.) By W. Dyson, M.D.

The patient was a girl, aged thirteen, presenting a tubercular family history. She had been quite well until three months prior to her first examination; but during that time her mother had noticed that her skin was getting darker. On admission to the hospital the patient was very anæmic and in a condition of marked asthenia. The blood was deficient in hæmoglobin and contained a slight excess of white corpuscles. The nervous symptoms consisted of a defective memory, marked depression of spirits, and a semi-comatose condition. The symptoms became aggravated day by day, coma increased, and death was preceded by convulsive seizures and periods of maniacal excitement. The tincture of suprarenal gland was used; but the condition was so far advanced that no idea of its efficiency could be obtained. The autopsy showed an enlarged, fibroid suprarenal gland on each side. Both glands contained cretaceous nodules, some of which were surrounded by caseous material. The chief interest centres in the occurrence of an advanced, typical case of Addison's disease in a girl aged thirteen, and the tendency to cretification and fibrosis of the suprarenals.

Typhoid Fever in Country Districts. (*Maryland Medical Journal*, May 11, 1895.) By William Osler, M.D., of Baltimore.

The dwellers in cities have a very deep concern in the prevalence of typhoid fever in country districts; because many cases originating in the

country are treated in the city and help to swell the mortality bills; because the city people take their holidays in the country in the seasons when typhoid fever is most prevalent; because the water-supply of cities is derived from streams which pass through fairly populous districts in which every autumn typhoid fever prevails; and because the country sends an enormous quantity of milk for consumption in the cities, which is especially liable to infection with typhoid germs. The following questions may be very profitably discussed:

First, as to the prevalence of typhoid fever in country districts. Since the notification of cases of typhoid fever is not compulsory, there must be great difficulty in getting accurate figures as to the prevalence of the disease. To remedy this defect, the notification of every case of typhoid fever in the city and throughout the State should be enforced at the earliest possible date. Second, as to the conditions in smaller towns and in country places favoring the development and spread of typhoid fever and the measures to be adopted to prevent contamination of the water-supply. The outbreaks of typhoid fever which are most dangerous to the city population are those smaller, house epidemics in country places. In these it is very difficult to trace the infection. The State Board of Health should receive early notification of every house outbreak and suitable means should then be taken to prevent the diffusion of the poison. Third, the possible contamination of the milk-supply and the inspection of dairy farms. How many cases of typhoid fever occur in the families of those who supply milk to the people in the city? It is not alone from the water of a contaminated well, used for washing the milk-cans, that infection arises; but in many instances from the direct contact of dirty hands with the milk or with its container. The only possible safeguard is a rigid system of dairy inspection.

Discussion by Charles M. Ellis, M.D., of Elkton, Md.

Country typhoid fever is much less fatal than its city congener. The determination of the mortality of any disease in a country district is difficult, even where a system of vital statistics prevails. The absence of such a system is a glowing shame to any civilized community. The typhoid epidemic of Elkton in 1884 and 1885 was initiated by the distribution of infected milk. There were one hundred and thirty cases, with three deaths. The methods of the distribution of typhoid fever in towns which have a public water-supply and sewerage system are in no way different from those that prevail in cities. In most towns of two thousand population in Maryland, there is a public water service but no sewerage system. The public water is used only by the well-to-do, the great mass of the population being obliged to depend upon wells, so that in these towns the inhabitants are liable to infection through the well-water. How do these wells become infected? The country privy-pit is almost universally blamed. I have never seen localized typhoid fever that could be satisfactorily traced to this receptacle; but have repeatedly seen outbreaks of typhoid fever due to well

impregnation the result of surface washings, which is the method of infection in the majority of cases. The greatest difficulty in the problem of prevention of typhoid fever relates to the unseweraged towns and villages, and the solution depends alone upon the systematic, public collection of human excreta by the pail or some similar method, the licensing of the milk-vender, and the suitable inspection of the legal dairy and the milk product.

Discussion by James F. McShane, M.D., of Baltimore.

Open wells are frequent centres for the distribution of typhoid fever in country towns and villages. The sanitary value of a source of water-supply depends not only on its present condition, but also upon the possibility of future pollution. The restriction of pollution by sanitary inspection is useful and is undoubtedly beneficial. The securing of unpolluted supplies and their maintenance as such rather than the classification of those already polluted will attain the surest results in the protection of the public health against disease disseminated by polluted water.

The Dyspeptic Forms of Chlorosis.—By Dr. Henri Huchard, of Paris.¹

All practitioners have observed rebellious forms of chlorosis that resist all methods of treatment,—iron in all its forms, arsenic and its preparations, condensed foods, with cinchona compounds, sea bathing, trips abroad, etc. When chlorosis presents itself in its dyspeptic forms, it is useless to give iron at first, and the principal reason why this drug fails in its action is because it is given too soon, in too large doses, and when gastric symptoms are present.

Functional disturbances of the stomach in chlorosis have been observed for a long time, and have been spoken of under different names. Hoffman and Haminton speak of an adynamia of the intestinal tube, Bean and Luton, of dyspepsia, while the last author says that there is a secondary anæmia due to gastric and intestinal hemorrhages. Professor Hayem says that without doubt one often enters into chlorosis by dyspepsia, but that more often we see dyspepsia caused by chlorosis. Digestive troubles are many and complex in chlorosis. The appetite is often diminished and perverted. Hyperæsthesia of the mucous membrane of the stomach is present, or prolonged digestion with a sensation of weight, fulness, and epigastric tension, nausea, or vomiting. Dilatation of the stomach, with gaseous eructations or abnormal fermentation, is said to be found in four-fifths of all cases. A false form of dilatation is observed in young women with vertical displacement of the stomach caused by constriction of the corsets, and this source of error is to be remembered. Finally, gastralgia, due to a nervous state, not to anæmia, and disturbances from reflex causes may be present in chlorosis.

¹ Translated by Thomas Linn, M.D., by special arrangement with the author.

The chemical element of the stomach is often disturbed; in eighty-seven cases it was found normal only seven times, being hyperhydrochloric forty-eight times, and hypohydrochloric in thirty-two cases. The frequency of hyperacidity explains the causation of ulcer of the stomach in chlorosis.

As regards treatment, iron should not be given until the dyspeptic state has been alleviated; the diet should consist largely of milk, and when this is not well borne, of water or a light infusion of tea; hot drinks are useful for exciting gastric secretion; eggs, vegetables, lean meats, chicken, and cooked fruits are permitted. A half-hour before meals small doses of an alkali (six to eight grains of bicarbonate of sodium) are given, and a half hour after meals a wine-glass of a solution containing two grammes of hydrochloric acid to a pint of water. In certain cases, a solution of lactic acid may be used with great advantage. An important indication is to prohibit the use of wines, preparations of cinchona, and all exciting aliments and drinks. In gastric fermentation the stomach may be washed out with a solution of one gramme of salicylic acid to a quart of water. After from two to four weeks of treatment of the stomach iron may be given, but even then it may exaggerate the dyspepsia, and often remains inert, because the quantity of hydrochloric acid is so small that the drug passes into the intestines in an insoluble state. In such cases the iron must be given before meals and acid a half hour after meals. The proto-salts of iron are to be preferred, as advised by Hayem. The proto-oxalate, protolactate, protochloride, and protoiodide are given, beginning with small doses, ten centigrammes (one and a half grains), twice a day, and never giving more than forty centigrammes (six grains) a day.

Rachitis considered an Infectious Disease. (*Archivio di Ortopedia.*) By Dr. Microli.

The author divides rachitic patients into two groups: the first with a constitutional disease, the second with an infectious malady caused by the ordinary pyogenic microbes. From his clinical study of the disease he concludes that,—

1. Rachitis is found in all social conditions; it is sometimes epidemic.
2. Rachitis usually follows an intestinal catarrh accompanying dentition, eczema, furunculosis; sometimes it is congenital.
3. In the development of rachitis the temperature is more or less elevated, approaching intermittence.
4. During the progress of the osseous lesions, the child suffers from pain in the region affected, and especially in the articulations of the thorax, as if from a polyarthrititis.
5. The weakness of the extremities is not always due to atrophy of the muscles in the region of the diseased bones. It is often due to cerebro-spinal affection, causing true paresis.
6. Hydrocephalic rachitis, not congenital, arises from exudation into the central nervous system.

7. Marasmic rachitis frequently exists, which has been distinguished from athrepsia by the size of the head and of the articular extremities.

He finds, pathologically,—

1. Congestion of all the bones, especially of the epiphyses, and proliferation of the marrow-cells, which have the appearance of granulations, and tend to occupy the whole medullary cavity and to revert to the embryonic type.

2. Decalcification of the osseous trabeculæ which are in the vicinity of the blood-vessels.

3. Hypertrophy of the connective tissue, with an appearance like cicatricial tissue at the line of ossification.

4. Vascular new formation.

5. Metaplastic ossification.

6. Congestion; exudation of serum into the nervous system.

This picture of an inflammatory process, together with the epidemic development of the affection, the non-congenital hydrocephalus, the absence of known cause for stasis, all favor the theory of parasitic infection. The author has found the pus organisms in the bones and in the central nervous system of a rachitic child.

Experiments made by injecting the bacillus pyogenes into the bones and the epiphyseal cartilages of small rabbits gave the following results:

1. Purulent osteomyelitis, especially of the epiphyses, attacking and destroying the cartilages.

2. Hypertrophic osteomyelitis, with small abscesses.

3. Osteomyelitis, without a trace of suppuration, with hypertrophy of the epiphyses and alteration of the cartilages.

4. Osteomyelitis, with marked hypertrophy of the epiphyses, hypertrophy of the cortical zone, and multiplication of the vessels.

5. Rachitic marasmus.

6. Hypertrophy of the infected cartilage, resembling that of rachitis.

7. Marked exudation into the ventricles, with cocci in the interior of the brain.

While the author does not assume that he has produced in young rabbits all the symptoms of rachitis, he thinks that the results obtained—osteomyelitis without formation of pus, marasmus, and hydrocephalus—are precisely similar to some of the forms of that disease.—*Gazette Médicale de Liège*.

Typhoid Fever among Natives in India. (*Indian Medical Record*, March 1, 1895.) By Ram Kishen, L.M.S., of Amritsar.

Many natives of India suffer from typhoid fever in a mild or severe form at some period of life. The season of greatest activity of the typhoid fever poison in India is in the dry, hot, summer months; when filth is scattered in fields and collected in heaps near and in villages and towns, and when lanes saturated with liquid animal excreta are freely exposed to the hot rays of the sun. The atmosphere is thus adulterated

with gases resulting from decomposition, with no natural cleansing process, except the occasional dust storms, to purify it. Next to the summer months, the poison is active in the dry part of winter; then in the rainy season, and, lastly, in the spring. There are many difficulties to be overcome before arriving at an accurate diagnosis, the principal one being that, on account of the existence of the disease in an endemic state, the majority of the population are afflicted in their infancy in the form of infantile remittent fever, which does not come under scientific observation. In the native adults the disease is generally of a milder type than in Europeans. A second source of difficulty lies in the frequent complications of an inflammatory nature which occur in the lower grades of population, and which often mask the true nature of the complaint. Lastly, the influence of malaria and heat on the course of the temperature deserves attention. The attacks among adults are usually mild, the highest temperature being 103° F.; the eruption is rarely seen; diarrhoea is an exception, constipation taking its place; headache is almost always present, but delirium never; tympanites and crepitation in the right iliac fossa are observed in the majority of cases. In some cases the attack is a severe one, and is then typical. The disease is not new in India, and there is plenty of evidence in authoritative (Persian) medical works that it has been prevalent in the country for a long time.

A Case of *Filaria Sanguinis Hominis*, with Chyluria, treated successfully with Methylene Blue. (*New York Medical Journal*, June 15, 1895.) By Austin Flint, M.D.

The author gives an interesting account of a case of *filaria sanguinis* seen by him in the practice of Dr. Joseph N. Henry, of New York.

The patient, twenty-two years of age, colored, was born in the West Indies, and had been in this country only ten months. On March 2, 1894, when he presented himself for treatment, he complained of headache, pain in the small of the back, of rapid emaciation, and muscular weakness. The temperature was elevated one degree. The urine looked like rich milk. Examination of the blood for *filariae* was made at 12.30 A.M.; an average of ten embryonic *filariae* was found in each field of the microscope. Their diameter was that of a blood-corpuscle, their length being forty to fifty times their diameter. Their movements were extremely rapid. They seemed to have a well-marked head, and a cylindrical and striated body terminating in a filament-like tail.

A specimen of the chylous urine was examined by Dr. Flint, with the following result: The urine was white and opaque with a very slight reddish-yellow tinge, reaction acid, specific gravity 1021.5, no urinous odor. When agitated with an equal bulk of ether, the urine became nearly clear. It contained thirty-nine per cent. in volume of albumin, no sugar. Microscopical examination revealed minute fatty granules, red blood-corpuscles, a very few oil globules, a very few leucocytes, and bacteria.

On the following day the writer saw the case and suggested the use of methylene blue in the treatment. On March 5, the patient received two grains of methylene blue, and the dose was repeated at intervals of four hours during the day. The blood was examined at eleven o'clock the same night, and only two filariæ were found on four slides. They were very sluggish and were stained a decided blue, as was also the blood plasma to some extent. The urine, in the mean time, had become perfectly transparent, and was stained a greenish-blue. The blood was examined on the 8th and 11th of March without finding any traces of the embryonic filariæ. On March 12 the urine had again become milky, and on the 13th the embryonic filariæ were found in considerable numbers. The patient was again given methylene blue, and on the third day afterwards the blood was examined for the organisms. Several dead filariæ were found. The urine had entirely cleared, being found normal on chemical and microscopical examination, except for its deep blue stain. The treatment was discontinued at the expiration of five days. The filariæ did not reappear, and the urine remained normal.

From the prompt and decided effects of the methylene blue in this single case, it appears to be an efficient remedy for chyluria depending upon *filaria sanguinis hominis*. It may also be of benefit in the treatment of other diseases due to the filaria, such as chylous collections in the peritoneal cavity and in the cavity of the tunica vaginalis testis, in hæmaturia, and in elephantiasis.

The writer has used it successfully in malarial enlargement of the spleen, in chronic cystitis, and in a few cases of gonorrhœa, giving it in doses of a grain and a half to two grains, in capsules, two or three times daily. His attention was directed to its use in gonorrhœa by an article by Dr. Max Einhorn, and his own experience confirms the observations of Dr. Einhorn, although Dr. Flint used methylene blue instead of methyl blue.

A Case of Tubercular Pericarditis with Double Pleurisy and Large Effusion; Pulsus Paradoxus. (*Glasgow Medical Journal*, February, 1895.) By Samson Gemmell, M.D.

A male patient, aged forty-four, was admitted complaining of dyspnœa, palpitation on exertion, and general weakness. The symptoms were of two weeks' duration. At the time of his admission the patient was breathless and complained of beating at the heart; his face was pale and the lips and finger-nails were cyanotic. The pulse was rapid, 120 per minute, weak, soft, and compressible, markedly dicrotic to the finger and hyperdicrotic to the sphygmograph. The area of cardiac dulness was slightly enlarged, and on auscultation there was heard a paricardial friction. Twenty-five days after admission the pericardial friction had disappeared, and there had been no evidence of effusion into the pericardium. Some time previously, however, there were evidences of left-sided pleurisy with effusion, and tapping yielded forty-one ounces of fluid. The pulse ever since admission had ranged about 120 per minute and on most occasions betrayed a decided

tendency to *pulsus paradoxus*; fairly vigorous pulse-waves during expiration, with great diminution and, in some cases, almost total abolition during inspiration. The fluid effusion into the left pleural sac continued to recur and rendered repeated tapping necessary. Seven days after the first tapping there were evidences of effusion in the right pleural sac, which was punctured and twenty-nine ounces of clear, serous fluid were withdrawn. The case ran on for nearly two months, during which time the pleuræ were tapped fourteen or fifteen times, the left more frequently than the right; the total quantity of fluid withdrawn since admission being seven gallons and two ounces. Four days later there was albumin in the urine and ascites and œdema of the feet and legs were first noticed. The patient died suddenly from cardiac failure. At autopsy there was found a tubercular pericarditis with adhesions and great thickening, tubercular pleurisy, old and recent tuberculosis of the mediastinal glands, and traction diverticula of the œsophagus. The occurrence of the *pulsus paradoxus* is explained by the adhesion between the tubercular mediastinal glands, the aorta, and the thoracic walls. During expiration these adhesions did not interfere with the lumen of the aorta and the flow of blood in the large vessels was unimpeded; but during inspiration traction was exercised on the adhesions and the discharge of blood from the left ventricle was interfered with. The condition was first described by Kussmaul. Adhesions between the mediastinal glands and the œsophagus produced the traction diverticula.

Various Forms of Disease the Result of Sewage-Poisons. (*Medical Magazine*, August, 1894.) By Sir George Johnson, M.D. (Lond.), F.R.S., of London.

The degree of proof as to the etiological relationship between sewage-poisons and the different forms of disease referred to in this communication varies in different cases. In some instances the evidence has all the convincing force that could be derived from a carefully-conducted experiment, and the proof is scarcely less than demonstrative, while in other cases the evidence amounts to no more than a very high degree of probability. In every case referred to, the conclusion that sewer-poison was the cause of the disease was not arrived at until, after careful inquiry, all other known causes were found to be absent. Among diseases thus caused are pleuropneumonia, diphtheria, typhoid fever, albuminuria, diarrhœa, particularly in children, cholera, erysipelas, and puerperal fever. It has been objected to the doctrine of the occasional *de novo* origin of such infectious diseases as enteric fever and diphtheria, that it implies a belief in spontaneous generation. On the contrary, it may with more reason be maintained that this doctrine is consistent with and receives support from the theory of evolution. It is reasonable to suppose that common bacilli and micrococci, which are constantly entering the body through various channels, may, under certain insanitary conditions, be converted into morbid germs. It has sometimes been asserted as a reason, or rather as an excuse,

for doubting the noxious influence of sewer-poisons that men who are engaged in cleansing sewers do not suffer from any excess of disease. The reply to this is that there is no proof of the asserted immunity of these workmen.

THERAPEUTICS.

IN CHARGE OF ALEXANDER D. BLACKADER, B.A., M.D.,
Professor of Therapeutics, McGill University, Montreal, Canada,

ASSISTED BY

D. J. EVANS, M.D.

On the Internal Application of Pilocarpine in the Treatment of Nephritis. (*Lyon Médical*, April 14 and 21, 1895.) By M. Mollière, M.D.

In a long and interesting article, the writer advocates the use of this drug by rational application, securing in this way a purely local diaphoresis, with a minimum dose of the alkaloid, and without the dangers and inconveniences sometimes accompanying its subcutaneous injection. His method of applying it is as follows: An ointment made with nitrate of pilocarpine and white vaseline, of the strength of one part in one thousand or two thousand, is applied, by friction, to the skin of the whole trunk, which is then enveloped in a thick layer of cotton-wool and a sheet of oil-cloth, and the whole maintained in place by bandages. This may be left on until the reapplication of the dressing on the following day, unless the perspiration is so free as to make it uncomfortable. Improvement to many of the symptoms in Bright's disease may be noticed in a few days, but it is important to carry out the treatment regularly until the more serious symptoms have passed away. Under this treatment, the author claims the following results: (1) From the first application the patients acknowledge a feeling of marked relief. (2) A very abundant perspiration follows, at first neutral in reaction, but afterwards becoming acid. This is accompanied by a marked diuresis but no salivation; the amount of urine may rise to two or three litres in the twenty-four hours, and in acute nephritis even higher figures may be noted. (3) Under this treatment the albumin disappears rapidly in acute cases, and the cure is complete. In chronic cases, although we cannot look for a cure, the œdema disappears, the albumin diminishes, and the general state is markedly improved.

Dr. Mollière has treated fifty cases by this method, obtaining the best results in cases of acute or subacute nephritis. The only contra-indication is uræmia, which may demand more energetic treatment. He regards this method as perfectly harmless even in very high degrees of sclerosis of the kidneys, but in advanced cases the results are not so satisfactory as in the earlier stages.

On the Treatment of Acute Pneumonia by Ice-Cradling. (*British Medical Journal*, May 11, 1895.) By P. Blaikie Smith, M.D.

In a short paper the writer relates his experience with five severe cases of sthenic pneumonia treated in the following manner: The patient clothed in a cotton night-dress is placed in bed, with a sheet covering the mattress over the body and legs are arranged two large cradles, extending from the shoulders to the feet. To the arches of the cradles are attached six or eight small pails filled with ice; a thermometer is suspended from the centre of the upper cradle, and both the cradles are covered first with a blanket, second with a water-proof, and lastly with the ordinary coverlet. The ice-pails are recharged as the ice melts, about every two or three hours. The temperature of the air under the cradles, as well as that of the patient, was ascertained at frequent regular intervals. The patients expressed themselves as feeling comfortable under the treatment. One or two of them complained of cold feet, and in these cases short stockings were permitted to be worn. The writer calls attention to the fact that he found the temperature under the blankets to be much reduced by simple cradling, even without the introduction of the ice-pails. He recommends this treatment as a mild form of antipyretic treatment, suitable for sthenic cases, easy of application, and comfortable, and not fatiguing to the patient.

The Antitoxin Treatment of Tetanus. (*The Practitioner*, April, 1895.) By R. T. Hewlett, M.D.

On experimental grounds, the writer considers the modern treatment by antitoxin most promising. As a remedy it ought to be administered as soon as any distinct symptoms set in, such as stiffness of the neck, difficulty in opening the mouth, or even any considerable pain at the seat of injury coming on a few days after the accident without apparent cause. Local treatment should not be omitted. At the same time the patient should be placed in a darkened room, and absolute quietness enforced. Abundance of easily digested food should be administered if necessary through a stomach-tube during chloroform anæsthesia. Chloral may be used to induce sleep.

On the Value of the Serum Treatment in Tetanus. (*Medical Chronicle*, May, 1895.) By A. A. Kanthack, M.D.

Before estimating the value of this new treatment, the writer endeavors to draw some conclusions as to the course and mortality of the disease under old methods. The percentage of deaths, he thinks, is estimated most correctly by Roux and Vaillard, who place it about fifty per cent. The severity of a case may be considered as varying inversely with the length of the incubation period, and directly with the rapidity of the onset of the spasms. Examining, according to these considerations, the results so far obtained and published of those cases in which antitoxin was used, he estimates that out of seven severe cases in which the incubation period

amounted to seven days or less, only one case recovered. In thirty-eight milder cases six deaths occurred. Summing up an exhaustive review, he says, "It seems that the serum treatment has not actually changed the prognosis in acute and serious cases. In milder cases, judging from their reports, it may lessen the spasms, the pain, and the distress, and has apparently reduced the mortality in this class, but to what extent we are not yet able to estimate. The antitoxin is still on trial, and, although no really acute, or otherwise hopeless, case has yet been definitely cured by it, yet it is still our duty to employ it, not only for the purpose of cure, but also with the view of prevention, in such injuries as have been contaminated by dirt or earth, and have not received immediate attention or thorough cleansing."

Notes on Orchitic Extract. (*British Medical Journal*, June 8, 1895.)

By H. Grey Edwards, M.D.

The author has given the extract in a large number of cases, with excellent results. He says that all cases of nervous disease, without organic lesions, which are benefited by bromide of potassium, will receive ten times as much good from orchitic extract. In old men in whom the system suffers from the want of the vital fluid secreted by the testicle, which would be reabsorbed into the blood in a new form, the extract is of great value, enabling them to devote themselves to business with increased vigor, and to endure much more physical exercise than they were capable of doing prior to taking it. He cites several cases which he considers types of the conditions which are benefited by this treatment. Case I.—A prematurely aged, exceedingly thin and anæmic man, sixty-five years of age, confined to his bed, and so weak that he could scarcely speak, was given four tabloids of the extract each day. In two days he was much better, and on the tenth day he was able to walk down-stairs without aid. Some weeks later, after returning to his office, he took a very long walk and died from the over-exertion. Case II.—A woman, aged sixty, whose husband died six months previously, had lost weight, suffered from dyspepia, and appeared feeble and failing. These symptoms all disappeared under treatment with the orchitic extract. Case III.—An unmarried woman, forty-five years of age, suffering from nervousness and strange fancies, took tabloids of the extract from July 18, 1894, to March, 1895. The nervousness disappeared and she nearly doubled her weight. As this patient had been in the writer's care for five or six years and all the remedies used had failed to do good, he feels justified in attributing the cure to the extract. Cases IV. and V.—Two sisters approaching the climacteric period, one a widow, the other married to an elderly man, were both suffering from palpitation, flatulence, and extreme nervousness. These symptoms soon passed away under this treatment. Case VI.—In a case of impotence in a man, although the tabloids were of no value as regards the impotence, the patient soon felt stronger and more energetic.

Action of Bicarbonate of Soda on the Gastric Secretion. (*Bull. gén. de Thérapeutique*, December 15, 1894; *Medical Chronicle*, March, 1895.) By Linossier and Lemoine.

The authors published in 1893 the results of experiments on the action of this drug on the gastric secretion. Their conclusions were controverted by several writers, and experiments brought forward seeming to contradict their own. They have, therefore, taken up the question again, and had for their subject a young soldier who had the power of returning at will the contents of his stomach. Bicarbonate of soda was administered in varying quantities both before and after a meal, and a careful analysis of the chyme was made several times in the course of each experimental digestion. They sum up their conclusions as follows: The immediate action of bicarbonate of soda on the gastric secretion is essentially stimulating. If the dose is small or medium, the stimulating effect continues after its neutralization and provokes an increase of hydrochloric acid secretion. If the dose is large, the secretory energy of the mucous membrane is exhausted in counteracting the alkalinity, and when an acid reaction of the chyme is once more re-established, the period of stimulation is arrested, and the normal amount of acidity may not be reached when the food passes out of the stomach. The stimulating action is manifested most markedly when the drug is administered before meals. The authors add that it may be supposed that, by a repetition of a moderate stimulus, the mucous membrane of the stomach may take on a persistent hyperactivity, which would explain its good results in patients with diminished hydrochloric acid secretion. On the other hand, its sedative action in large doses in cases of hyperacidity may be due to exhaustion of the mucous membrane by the repeated powerful stimulation. At the same time prolonged treatment with large doses results in increased alkalinization of the blood, reducing the acidity of all acid secretions. It would appear desirable in cases of hyperacidity to endeavor to alkalinize the blood without stimulating the stomach, by administering the drug per rectum, or in the form of a salt of an organic acid, —*e.g.*, as a citrate or lactate.

SURGERY.

IN CHARGE OF HENRY R. WHARTON, M.D.,

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AND

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Osteotomy of the Tibia for Extensive Osteomyelitis followed by Compensatory Hypertrophy of the Fibula. (*Revue d'Orthopédie*, March, 1895.) By Gérard Marchant, M.D., of Paris.

In many cases of osteomyelitis of the tibia the bone does not renew itself, and is not strong enough to maintain the weight of the body without the assistance of mechanical appliances.

In the case reported, the tibia did not fill up, but the inconvenience was compensated for by the excessive hypertrophy of the fibula. The patient came under the care of the author, suffering from multiple osteomyelitis in a number of localities, but most aggravatedly in the tibia, where it involved the knee-joint, and necessitated the osteotomy extending from the tuberosity of the tibia to about two inches above the lower extremity of that bone. The patient was seen six years after the operation. The leg has a decided curve backward and outward, and is markedly shortened. The knee is very prominent, and examination shows this to be due to the head of the hypertrophied fibula whose styloid process is on a level with the superior border of the patella, and whose hypertrophied head projects backward and outward, where it has been forced by the lack in development of the tibia, and in sustaining the weight of the body. The tibia is flattened or nearly wanting in its middle third, but is normal in the lower third. The foot is in its normal relation. The entire limb is markedly shortened. The fibula is very markedly thickened, especially antero-posteriorly. Walking is easy, and the knee can be bent to a right angle.

The Paraplegia of Pott's Disease treated by Lateral Drainage. (*Revue d'Orthopédie*, March, 1895.) By V. Ménard, M.D., of Berk-sur-Mer.

The difference in the effect upon the paraplegia in two cases in which this author performed laminectomies, the one in which a tuberculous abscess was opened and drained recovering rapidly and completely, while the other remained unaffected, led this author to draw the conclusion that possibly the difference was due to the opening of the abscess,—that the pressure of the abscess was the cause of the paraplegia, and that its drainage would cure the distressing symptom. The theory based upon this reasoning was confirmed by two operations, one in one of the above cases of laminectomy where the abscess was found and opened, and the paraplegia cured, and the other in a case upon which no former operation had been attempted, and upon which only opening and drainage was performed. In both cases the paraplegia began to disappear immediately after the opening of the abscess cavity. In further support of the theory and establishment of the utility and efficacy of this operation, the author reports three cases recently operated upon, in detail, in which the paraplegia had existed for a long time before the operation. The immediate result in these cases was that a few hours after the opening and drainage of these abscesses the patients felt a relief from oppressive feelings, and a return of sensation in the lower extremities. The power of voluntary motion began upon the first day and gradually increased until, at the end of the tenth, fifteenth, and twenty-fifth days respectively, they could stand up, and walking became possible. The retardation of sensa-

tion disappeared rapidly, the exaggerated reflexes and contractures decreased little by little. The paraplegia in these three cases had existed six, three and one-half, and three years before the operation. The recovery was, however, as rapid as in the more recent cases. The author, in his operation, attacks the osseous seat of the disease and origin of the abscess in the following manner: An incision, two or three inches in length, is made over the most prominent part of the spinal curvature on the side where the greatest area of dulness has been detected. The transverse process on that side is then bared of its periosteum, and removed subperiosteally, first from its costal attachment, and then torn away as a whole or in fragments from its attachment to the vertebra. The grooved director is then pushed beneath the periosteum along the lateral aspect of the vertebra, until the necrosed bone is touched and the abscess discovered. Pus generally shows itself as soon as the transverse process is removed; it is then only necessary to enlarge the opening. The persistent and immediate improvement in the paraplegia in all cases, and its absence after ten, eleven, and fourteen months, in three cases, are markedly successful results.

Large Urethral Defects and their Treatment by Urethroplasty. (*Wien. klin. Wochen.*, May 16, 1895.) By Professor V. Dittl, of Vienna.

The author has made a careful study of those cases in which a traumatism arising from a blow upon the symphysis or ascending rami and symphysis of the pubes has produced a solution in the continuity of the urethra without producing a fracture of the bones. For the lesser defects he advises the passage of an English gum catheter through the urethra into the bladder from the proximal end of the urethra at the point of rupture, and this to be followed by the introduction of the other end of the catheter into the distal portion of the urethra, the fistula being allowed to close by granulation. This method, however, when applied to fistulæ in which there has been a greater loss of urethral tissues does not succeed, and there remains a cicatrix and within it a fistula, while simple freshening of the edges of the wound and closure by sutures is hardly ever successful. For larger fistula, in which the urethral defect has an extent of over three-quarters of an inch, he advises the following operation which he performed successfully in a case where there was a defect of over one and one-quarter inches in the bulbous portion of the urethra, there remaining of it only the upper portion and a small part of the sides. An incision was made one-quarter of an inch from the edge of the wound, which was granulated, elliptical in form, having a diameter in its widest part of over one inch; this incision passed down through the sound skin on the left side, parallel to the granulating surface of the wound, and formed a flap attached at its base along the mucous edge of the fistula, and capable when laid over on the right side of covering that side, and bringing the old granulating surfaces in contact. These surfaces were then freshened, and, to hold them in apposition until they had united, three silver sutures were passed through the

base of the flap, emerging just above the mucous membrane of the fistula on the left side, and entering the right side just above the mucous surface, emerging on the skin of the right side one-quarter of an inch from the margin. When united they formed a deep suture, which included the flap and held the two freshened granulating surfaces in contact. A few points of silk suture between the silver sutures united the skin. The wound was dressed with an iodoform and sterile gauze dressing, the wound made in forming the flap being allowed to heal over by granulation. A catheter was allowed to remain in position after the operation. The process of healing was benign and without fever; the stitches were removed on the twenty-fourth day. There then persisted two minute sinuses at the extremities of the wound, which healed in eight days. There followed, however, as a complication, an acute suppurative prostatitis, which easily yielded to treatment. The patient made a complete recovery, being able to retain the urine from two to two and one-half hours, and then making a good stream. The author advises the use, at intervals for some time, of sounds to overcome the well-known tendency of scar tissue to contract. A second case yielded equally successful results and was without fistulæ; two flaps were formed in this case, one from either side.

The Radical Cure of Umbilical Hernia. (*La Semaine Médicale*, March 9, 1895.) By Professor Tillaux, of Paris.

The author describes the following method of performing this operation, as devised by his assistant, Dauriac. The operation is performed in the ordinary manner by opening the sheaths of the recti muscles and suturing together the two recti after the excision of the umbilicus and the hernial sac. The modification original with Dauriac consists in making in each rectus muscle a longitudinal incision, which divides it into two parts for about one-third of its length on either side of the umbilicus, and includes the anterior portion of the muscular sheath. The external portion of each rectus is left intact, thus preserving the primitive continuity of the recti muscles. The internal portions of the two muscles are divided by a transverse incision at their upper attachment to the main rectus, just below the suture which unites the upper thirds of the recti. They thus form two bands attached to the lower third of the recti by their bases, and after their detachment from the upper third of the recti they are much less retracted than the parts forming the continuity of the muscles. This facilitates the crossing of the two bands, which is the next step, and their attachment to the superior third of the recti of the other side, attaching the right, where the left had been cut by the transverse incision, by means of longitudinal sutures. In order to give solidity to these sutures, the author passes a transverse suture through the muscle between the line of insertion of the sutures and the end of the muscles. The transposition and crossing of the bands having been accomplished, a single suture is placed between the remaining portions of the recti at the median point, and drawn sufficiently

to bring them in contact with the crossed portions, and secure union. The operation is completed by the suturing of the skin and subcutaneous tissues. A number of successful cases are reported by the author.

Pancreatic Cyst treated by Drainage; Recovery. (*Boston Medical and Surgical Journal*, March 21, 1895.) By Maurice H. Richardson, M.D.

The patient, an Italian laborer, twenty-six years of age, noticed a painless swelling in the pit of the stomach six weeks before the operation. At the time he entered the hospital, a fluctuating non-resonant tumor as large as an adult head distended the upper half of the abdomen. It was so painful that he could not sleep at night, but there was no interference with digestion or bowels. A diagnosis of cyst of the pancreas was made and an operation immediately performed.

An incision was made between the umbilicus and the ensiform cartilage; the omentum was carefully separated, the tumor was brought into the field and its contents aspirated. About two pints of fluid was withdrawn. A free opening was then made, and about two quarts of fluid escaped. Exploration with the finger showed a large cavity situated in the retroperitoneal space usually occupied by the tail of the pancreas. Enucleation was attempted, but the cyst was found to be too adherent to the surrounding structures. The cyst-wall was stitched to the abdominal wound and a large drainage-tube was inserted. In three weeks the discharge changed from a viscid, grayish fluid, that did not emulsify fat, and did not have diastatic action or digestive properties, to one possessing all the characteristics of pancreatic fluid. Nine weeks after the operation the cavity of the cyst was obliterated, a sinus remaining through which a probe could be passed nearly to the bodies of the lumbar vertebræ.

In considering the surgical treatment of pancreatic cyst, the author concludes that enucleation of the cyst should be practised when it can be easily separated from its attachments, and thoroughly extirpated without excessive hemorrhage; but if it can be separated by cutting the surrounding pancreatic tissue, then treatment by drainage should be preferred. In most cases, complete healing takes place after drainage, and the danger in this method of treatment is slight.

Wounds of the Bladder in Operations for Hernia. (*Annals of Surgery*, June, 1895.) By B. Farquhar Curtis, M.D.

The great increase in the frequency of this accident of late years is to be attributed to the altered methods of operating for hernia. The attempt to effect a radical cure, now made in even primary operations, necessitates complete dissection of the neck of the sac in order to ligate it, and for this reason the bladder is more likely to be wounded. The tissues of the herniated portion of this organ become so attenuated that its recognition is a matter of difficulty, even after it has been opened.

The bladder may be involved in hernia in at least three different ways.

The most common is a prolapse of a portion which is entirely extraperitoneal. Rarest of all is the true intraperitoneal form; and in the third and most dangerous, both the extra- and intraperitoneal portions are involved, the intraperitoneal forming a part of the wall of an accompanying hernial sac, usually lying posteriorly. It has been supposed that the bladder is very rarely present in femoral hernia, but in this collection of fifty-five cases, ten are of the femoral variety, and forty-five inguinal, proving that femoral hernia involves the bladder in a larger proportion of cases than does inguinal. Vesical hernia is found usually in advanced years and in people with old herniæ. In forty-five cases in which the age was known, nearly one-third were over sixty years of age, and two-thirds were over fifty at the time of operation. This descent of the bladder is ascribed by Cloquet and Roser to the traction exerted by a mass of extraperitoneal fat; it is probable, however, that the peritoneum of the hernial sac draws the organ out of the abdomen just as the cæcum or sigmoid flexure is often pulled down. In habitual constipation, the rectum being distended by fæces would lift the bladder to the level of the hernial apertures and favor its prolapse.

The diagnosis of this condition is oftenest made during the operation, for it is only rarely that symptoms relating to the bladder are found. Physical examination seldom gives a clue to the condition, but it may do so by revealing a flat, doughy tumor, in which cases the bladder should be explored by a large curved sound. During operation, one of the most constant indications of vesical prolapse is the presence of an unusual quantity of fat surrounding the hernia. The appearance of the bladder itself is very deceptive. The wall may be so attenuated that the muscle forms only a thin coating and is totally unrecognizable. In this collection of fifty-five cases, the bladder has been recognized twenty-three times before being wounded, in four it was not seen until it was wounded; in two it was not seen at all during the operation; in ten it was taken for the hernial sac; in four for a second hernial sac; in five for a tumor or cyst; in three for a thickened patch in the sac-wall; in three for properitoneal fat; in one for degenerated omentum, and in one for a haustrum of the colon.

When the bladder has been recognized before being injured, it should be freed and reduced, the ring being closed as usual by sutures. In cases in which it is difficult to dissect the bladder from the surrounding parts, it is wise to abstain from any attempt at radical cure and to leave the pouch *in situ*. If a distinct diverticulum is found, however, it is best to resect it, closing the opening in the bladder with sutures, rather than to return such a long pouch into the abdomen.

When the bladder has been wounded, there is a choice of three methods of treatment: The open method, which leads inevitably to the formation of a fistula; the ligature, which may be used to occlude the wound in cases of emergency, and the suture, which should be used if it is in any way possible. By this method, which gave such excellent results in my case, the

sutures were placed very close together, ten or twelve to an inch, and in three layers. The stitches of the first tier were passed through everything except the mucous membrane, and they held the divided muscular layer firmly together. The second tier were passed like Lembert's sutures of the intestine, turning in the first set slightly, and a third set, not so closely placed, rolled in and brought into contact still broader surfaces.

Excision of the Larynx. (*Medical Record*, March 23, 1895.) By Charles A. Powers, M.D., and George R. White, M.D.

The writers have gathered sixty-nine cases of either total or partial extirpation of the larynx, to which the two hundred and forty cases collected and analyzed by Eugene Kraus, in 1890, have been added. The histories of six new cases are given.

Of the three hundred and nine operations, one hundred and one, or thirty-two per cent. of the patients, died within the first eight weeks, from shock, hemorrhage, pneumonia, septic infection, or exhaustion. The cases collected by these authors show a decrease in the death ratio in the total excision,—twenty-nine per cent., as against thirty-six per cent. in the Kraus tables. The mortality in the partial operation is increased, being thirty-eight per cent., as opposed to twenty-five per cent.

Cases reported as free from the disease before the lapse of three years are of little value, except in that they diminish, by so much, the operative death-rate. Of one hundred and eighty laryngectomies done for carcinoma prior to January 1, 1892, seventy-two, or forty per cent., died as a result of the operation; fifty-one of the remaining one hundred and eight had recurrence during the first year, and eleven, or ten per cent. of the survivors, were free from relapse three or more years after operation. In seventy-seven cases of partial laryngectomy for cancer, twenty-six, or thirty-three per cent., died during the first two months; of the remaining fifty-one, seven cases, or thirteen per cent., are reported as free from the disease three or more years after the operation.

This operation has found its chief indication in carcinoma, but has been employed in sarcoma, polypi, tuberculosis, enchondroma, stenosis, and necrosis. Whatever the procedure chosen for the operation, preliminary tracheotomy is a prerequisite. It should be made well below the isthmus of the thyroid gland, and from three to fifteen days before the laryngectomy. This affords time for the lungs to become accustomed to the new manner of breathing, and the trachea becomes fixed to the anterior wall of the neck. During the operation of excision, the greatest care should be taken to prevent fluid from passing down the trachea into the bronchi. The tampon canula of Trendelenburg, or some modification of it, is most used for this purpose.

In the total extirpation, an incision is made in the median line, from the hyoid bone to a point a little below the cricoid cartilage, and a transverse incision over the hyoid bone meets it at the upper end. On exposing

the larynx the soft parts are bluntly dissected from it, and after the sides of the larynx become free, the inferior constrictor of the pharynx is to be cut close to its insertion into the thyroid cartilage. The trachea is next cut across, just below the cricoid, and drawn forward, its lumen being packed with sponges, or with iodoform gauze. The larynx is then dissected from the deeper parts until the upper corners of the thyroid are free, then the thyro-hyoid membrane is cut across and the larynx is removed. The epiglottis is either removed or left in place, according to its condition. The partial operation is usually performed by splitting the thyroid down the middle, packing the upper end of the trachea, and then removing as much of the larynx as is desirable.

Breathing is maintained through the tracheal tube for the first three or four weeks; an artificial larynx may then be inserted. A considerable number of these patients recover their voice, to a greater or less extent, without the aid of the artificial larynx. Examinations by Helmholtz, Landois, Fränkel, and others show that the upper part of the œsophagus serves as a receptacle for air, which puts in motion bands of mucous membrane at the base of the tongue.

The Present Treatment of Urethritis in New York. (*Medical News*, April 6, 1895.) By Ramon Guitéras, M.D.

The writer says that in the best dispensaries the treatment is excellent. In acute anterior urethritis, or before the process has travelled back beyond the compressor urethræ, almost all physicians agree on giving diluents, usually some of the potassium salts, in large draughts of water. A few others give antibleorrhagics, cubebs, copaiba, sandal-wood oil, or santal midi. Locally, the treatment varies more. A number give simply hand-injections of astringents, principally the zinc salts in mild solutions; others give anterior irrigations of a saturated solution of boric acid, or a 1 : 4000 solution of potassium permanganate through a fountain syringe having an elevation of two or three feet. Hot sitz-baths and frequent immersions of the organ in hot water are advised. The more conservative advise only restricted diet, diluents, hot sitz-baths, and frequent immersions for the first ten or fifteen days.

If these cases now become indolent, many resort to silver nitrate, and irrigations of solutions varying in strength from 1 : 16,000 to 1 : 2000 are given, either anteriorly or else by injection into the bladder, allowing the patient to expel them by urination.

Posterior urethritis or extension of an anterior urethritis into the posterior urethra is estimated as occurring in from twenty to ninety per cent. of all cases. When it is acute, the diluents are usually kept up. The antibleorrhagics are given by some and not by others. Local treatment consists in making silver-nitrate instillations into the deep urethra, beginning with one grain to the ounce, depositing from five to twenty drops at a sitting, and increasing in strength, or in injecting a few ounces of a 1 : 2000

solution into the bladder, allowing the patient to expel it by urination, and increasing this gradually to a greater strength.

The treatment of subacute urethritis dependent upon strictures seems to be alike with all, the rule being to dilate by sounds, and to cut those offering too much resistance to dilatation.

In hospitals the treatment varies, in that more care can be taken of the patients, and in that directions can be more thoroughly carried out. In private practice patients are treated more as they are in dispensaries, as they belong to the ambulant class.

The author treats the acute stage by diluents and anterior astringent hand-injections. The diluent consists of potassium bicarbonate and potassium citrate, containing enough citric acid to cause effervescence on being thrown into a glass of water. He uses three astringent injections of different strengths. The first is a modification of Ultzmann's, and is constituted as follows :

R Zinci sulphatis,
Aluminis,
Acidi carbolicī, āā gr. v ;
Glycerini, f℥ss ;
Aquæ destillatæ, q. s. ad f℥iv. M.

A second and stronger injection has the following composition :

R Zinci sulphatis, gr. x ;
Extracti hydrastis fl., f℥ss ;
Aquæ rosæ, q. s. ad f℥iv. M.

The third is still stronger, and is one of Ricord's favorites :

R Zinci sulphatis, gr. x ;
Plumbi acetatis, gr. xv ;
Tinct. catechu,
Tinct. opii, āā f℥i ;
Aquæ destillatæ, q. s. ad f℥iv. M.

In posterior urethritis the injections are discontinued, the diluents are given with the addition of ten drops of belladonna for the tenesmus. If this does not control the tenesmus, suppositories of extract of belladonna and morphine, each one-quarter of a grain, are used. After a little abatement of the symptoms, instillations of silver nitrate are given every other day, using one grain to the ounce and increasing in strength. The patient is put on sandal-wood oil, beginning with fifteen drops, and increasing five drops a day, or santal midi capsules, beginning with one capsule and running up to three, three times a day.

If the trouble continues in a subacute form, anterior irrigations of a 1 : 3000 potassium permanganate solution are given, and if still rebellious, a weak solution of silver nitrate, beginning with 1 : 8000, and increasing

to 1:1000 if necessary. If these methods fail, the urethra is carefully examined with an acorn-bulb bougie, and if narrowing or stricture is found, it is dilated with an Oberlander dilator or an ordinary Otis urethrotome. After dilating by a slow process, sounds of the Otis curve, anointed with equal parts of the ointment of red mercuric oxide and vaseline, are passed.

OBSTETRICS AND GYNÆCOLOGY.

IN CHARGE OF RICHARD C. NORRIS, M.D.,

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A Case of Ovarian Cyst weighing over Eighty Pounds successfully removed from a Girl under Seventeen Years of Age. (*Lancet*, June 1, 1895.)

The case cited was operated on in St. Thomas's Hospital, by Dr. C. J. Cullingworth.

The patient, a girl aged sixteen years, was admitted to the hospital April 30, 1895. She gave a history of a single menstruation, which took place in March or April, 1893, and said that in the latter month she noticed that she was growing large. She was tapped at Christmas, 1893, when a large quantity of fluid was removed, and again in February, 1894, and a third time in May, 1894; but without useful results. For the previous six months she had been almost entirely bedridden, because of the great size of the tumor. There were no symptoms referring to the bladder and rectum.

At the time she entered the hospital she was much emaciated, the eyes were sunken, and her cheeks had a livid hue. The chest was thin and the lower ribs were everted; dulness began at the lower border of the third cartilage, and the apex-beat was best felt in the third space. Liver dulness began at the fourth rib cartilage in the nipple line. The abdomen was enormously distended, and covered by large veins running from below upward to the thorax. About three and one-half inches above the umbilicus there was a sulcus with its convexity downward. There was dulness over the whole abdomen, except at the sides parallel with the lumbar spines and a resonant band over the stomach. The greatest girth was fifty-four and one-half inches. By vaginal examination the cervix was found to be pulled up and obliterated; the anterior vaginal wall was bulged downward by the tumor.

On May 3 abdominal section was performed. An incision eight inches long was made in the mid-line of the abdomen. A cystic tumor, formed of small cysts in its upper part and of somewhat larger ones in the lower part, was revealed. It was adherent to the abdominal wall, liver, spleen,

and omentum. The adhesions were separated and the cyst tapped with a large trocar, and then the septa between the cysts were broken down with the fingers. The pedicle was rather small and was tied in the usual way, and the tumor was removed. Its seat of origin was the left ovary. The right ovary and the uterus were healthy, but poorly developed. The tumor weighed between eighty and ninety pounds; the patient having weighed one hundred and seventy pounds on the night before the operation, and seventy-nine and a half pounds a week after the operation.

Alarming symptoms of collapse were present during the night after the operation, but the patient responded to stimulation by hypodermic injections of $\frac{1}{20}$ grain of strychnine and of brandy, and after the first twenty-four hours the recovery was uninterrupted. Dr. Cullingworth thinks that the most interesting points in the case are: the age of the patient, the enormous size of the tumor, and the advice given by the surgeon who first attended the patient (insisted that no operation should be performed). This case shows anew the uselessness of tapping ovarian cysts.

Transverse Septa of the Vagina. (*Boston Medical and Surgical Journal*, May 30, 1895.) By A. K. Stone, M.D.

Five cases of this rare condition are reported. Three of the patients, seen by the writer, were young women who had never borne children or suffered injury. Pregnancy existed in each case.

In the first, the septum was about two inches from the introitus, and contained an opening about one-half inch in diameter, which admitted the tip of the finger. The membrane was elastic and thin, and showed no signs of inflammation. Menstruation had always been regular up to the time of pregnancy. The second was a duplicate of the first, excepting that a few bands extended from the cervix to the membranous septum. In the third the lumen of the vagina, about two inches from the introitus, was distinctly narrowed by a ridge of tissue. There was uterine displacement, and some endocervicitis, but no history of injury or operation, and no tendency to contraction.

The two remaining cases occurred in patients seen by Dr. J. F. Scott. In one the septum was about one and three-fourths inches from the entrance to the vagina, and contained an orifice large enough to admit a uterine probe. During labor the septum resisted the advance of the head for several hours, or until it was slit in several directions. In the other, menstruation had always been irregular, intermissions being followed by a profuse flow of black and tarry blood, which lasted sometimes for fifteen days, and was accompanied by severe pain. The septum was one and one-half inches from the vaginal orifice, and contained an opening which admitted a uterine sound. It was very dense and tight, and fully one-eighth inch in thickness. The writer thinks that this anomaly may be explained by the following theory: The fusion of the Wolffian ducts, which form the genital tract, takes place during the third month of foetal life, and begins

about two-thirds of the way down the genital tract, extending both upward and downward. The septum may be the result of fusion beginning in two places, thus leaving a band that separates the upper and the lower part of the vagina. In the fourth month the genital tract becomes flattened, and the epithelial surfaces meet and grow together, forming an epithelial lamina which rapidly proliferates, the floor and roof of the vaginal tract are thrown into folds, an external thickened portion dilates and forms the ampulla of the vagina, and internally a cup-shaped outgrowth embraces the lower end of the uterus. In the sixth month the lumen of the vagina is formed by degeneration of the mass of epithelial cells. According to Tourneux's section, there are several distinct foci of degeneration, and the author thinks it possible that groups of cells between the foci retain their vitality, and thus form the transverse septum of the vagina.

Tubal Pregnancy, rupturing into the Peritoneal Cavity, and projecting through the Inguinal Canal, with all the signs of a Strangulated Hernia. (*Annals of Gynæcology and Pædiatry*, May, 1895.) By A. Malherbe.

The patient, a woman thirty-four years of age, was suddenly seized with pain in the abdomen while at stool, and immediately an old hernia became hard, distended, and extremely painful. Urination was impossible. The next morning she vomited bile, and for four days neither gas nor fæces were passed. Taxis for a quarter of an hour gave no relief and produced syncope. The patient said that a month before, after carrying a large basket of washing, she felt something give way, and then began to suffer with abdominal pain.

On examination the usual signs of strangulated hernia were found, and an operation was performed. An incision over the tumor revealed a tense sac, which, when punctured, gave issue to black, liquid blood, but on incision was found to be empty. The ring and walls of the canal were then opened, and blood and clots came away in abundance. The adnexa of that side were then examined; the tube was of the size of a walnut, and was ruptured posteriorly. The entire pelvis and Douglas's cul-de-sac were filled with clots and liquid blood. The adnexa were removed and the parts cleansed. The patient made a good recovery. The interesting feature of the case is the complete simulation of a strangulated hernia, the diagnosis being confirmed by an actual hernia. The author supposes that the blood came into the cavity previously occupied by the intestine, and formed an irreducible tumor by closure of the inguinal canal by a clot.

Tubal Pregnancy with Twins; Retention for Fifteen Years of a Dead Fœtus at Term. (*Bulletin Médical.*) By Folet.

One fœtus died in the second or third month of pregnancy; the other lived to term, which is an exceedingly rare occurrence in tubal pregnancy. The fœtal sac with its contents remained for fifteen years in the abdomen of

the patient without causing any illness. Then slight attacks of peritonitis, beginning with sharp pain, became frequent, and the patient entered the hospital for an operation. The foetal sac was adherent to the intestine, and a portion of the fundus could not be removed; it was sutured to the inferior border of the wound. Complete recovery took place in six weeks after the removal of the tumor.

The foetus is not a lithopædion. Its tissues are flexible, not calcified, but dense, and of the consistence of cooked lard. The tissues retain their normal structure.—*Maladies des Femmes*, April 25, 1895.

Vaginal Cœliotomy. (*Medical Record*, March 2, 1895.) By Hiram N. Vineberg, M.D.

The importance of being able to substitute vaginal for abdominal cœliotomy, the writer thinks, cannot be over-estimated. The fundus of the uterus can be passed easily through the longitudinal vaginal wound, and where uterine sutures are necessary they may be placed with the aid of the sight instead of relying chiefly on the sense of touch. The adnexa can also be drawn through the wound for examination or removal. This is done by tearing through the fold of peritoneum between the bladder and uterus, and making gentle traction on the uterus, by means of a temporary suture, towards the side opposite to the adnexa to be delivered.

Dührssen's term for this operation—"vaginal cœliotomy"—has been adopted by the author. Dührssen follows somewhat the same method. He makes a transverse incision in the anterior vaginal fornix, which is considered by the writer as much less advantageous than the longitudinal incision, as there is much more difficulty in returning the fundus to the peritoneal cavity. The bladder can be more extensively separated from the uterus and the broad ligaments through the longitudinal incision, and by its free separation the ureters are carried well forward, thus obviating the risk of including them in a ligature. The advantages possessed by the anterior longitudinal incision over the transverse incision in the posterior vault for salpingo-oöphorectomy are: there is less hemorrhage, and such as occurs is under better control; it affords more room; there is no danger of cutting into the rectum; there is less likelihood of coming into contact with the intestines in doing the necessary manipulation.

The advantages of the vaginal route for operation as compared with the abdominal are: 1. It opens up a smaller avenue for the introduction of deleterious germs; none but the operator's hand need come into contact with the peritoneum and intestines. 2. There is less manipulation of the intestines. In some instances they do not come into view, nor in contact with the operator's hands and instruments. 3. The absence of those distressing symptoms, such as thirst, vomiting, flatulence, etc., during the first twenty-four, forty-eight, or seventy-two hours, which may follow the simplest and most skilfully performed abdominal cœliotomy. 4. The avoidance of stitch and mural abscess. 5. The avoidance of the subsequent

occurrence of ventral hernia and troublesome fistulæ. 6. The absence of an external and skin cicatrix. This is more than a merely æsthetic gain. I have seen more than a few patients during the year in whom the cicatrix, though primary union had taken place, gave trouble by being painful, and showing from time to time an angry, red, and swollen appearance. The disadvantages of this route are summed up in one proposition,—the greater difficulty of doing the operation.

A large number of cases of backward displacements, with more or less disease of the adnexa, in which palliative treatment has failed, are especially suitable for this operation; also most of the cases of pyosalpinx and ovarian abscesses that have been treated hitherto by abdominal cœliotomy.

A Case of Uncontrollable Vomiting in Pregnancy; Abortion produced by the Curette; Recovery. (*Médecine Moderne*, May 1, 1895.)

Puech reported this condition in a hystero-neurasthenic woman. The pulse was very frequent,—124 to 128. The author, at a single sitting, emptied the uterus in the sixth week of pregnancy by means of the curette, and without loss of blood. The vomiting of the patient immediately ceased.

Charpentier stated that he was disposed to favor as early interference as possible in cases in which there is great disproportion between the pulse and the temperature. He has obtained excellent results with the following method for the production of abortion. He introduces into the uterine cavity, by the aid of forceps, a stick of solid nitrate of silver, and lets it melt there. In one case, by an error, a tampon of cotton saturated with a twenty-per-cent. solution of nitrate of silver was introduced, and produced the same result.

Marduel cited a case of a woman in whose family there was a case of insanity. She began vomiting early in pregnancy. After taking opium she could retain a little food, but symptoms of abortion appeared, and it is probable that the drug killed the fœtus. Ocular troubles began also at this time. A laminaria tent was introduced into the cervix, and after twenty-four hours the uterus was emptied. The operation was difficult and the parts were very much bruised. The vomiting ceased, but returned on the next day. The ocular symptoms increased until she was quite blind from retinal hemorrhage and œdema which were due to a cerebral lesion. Revulsion was obtained by placing a vesicatory on the back of the neck, after which the eye symptoms improved and the vomiting ceased. About a month after the abortion, Marduel was recalled and found the patient delirious. She died on the same day.

Hæmatoma of the Vulva and Vagina which occurred after Delivery.—Goldberg, in the last number of the *Centralblatt*, reports a case of hæmatoma of the external genitals, following confinement, an accident which

he considers very rare. Winckel estimates the ratio of its occurrence as one in sixteen hundred confinements.

The patient, a primipara, twenty years old, was delivered spontaneously of a large male child after three days of labor, which had been prolonged by rigidity of the cervix. The head of the child did not remain long at the vulva. Ten hours after the expulsion of the infant, the woman complained of pain seated at the level of the external genitals, and an enormous tumor developed. On inspection, a tumefaction of the left labium majus was found, which extended to the adjoining portion of the perineum. The tumor was very painful, of a blue color, and of the size of a child's head. In the centre of the mass, the cutaneous tissue had parted, leaving bare the adipose tissue.

It was found by digital examination that the tumor extended into the vagina, but it was impossible to fix its limits without causing the patient too much suffering. The uterus was not involved. Under applications of ice and of antiseptic solutions the affection ran a benign course without elevation of temperature.—*Maladies des Femmes*, March 25, 1895.

The Successful Preventive Treatment of the Scourge of St. Kilda (Tetanus Neonatorum), with some Considerations Regarding the Management of the Cord in the New-Born Infant. (*Glasgow Medical Journal*, March, 1895.) By A. G. Turner, M.D., C.M.

The first mention of trismus nascentium or tetanus neonatorum was made by Rev. Kenneth Macaulay in 1764, after a visit to the island of St. Kilda in 1758. This gentleman states that the infants of this island give up nursing on the fourth or fifth day after birth; on the seventh day their gums are so clinched together that it is impossible to get anything down their throats; soon after this they are seized with convulsive fits and die on the eighth day. So general was this trouble on the island of St. Kilda that the mothers never thought of making any preparation for the coming baby, and it was wrapped in a dirty piece of blanket till the ninth or tenth day, when, if the child survived, the affection of the mother asserted itself. This lax method of caring for the infant, the neglect to dress the cord, and the insanitary condition of the dwellings, make it extremely probable that the infection was through the umbilical cord. All cases in which treatment was properly carried out by competent nurses have survived. This treatment consisted in dressing the cord with iodoform powder and antiseptic wool, the breast-feeding of the baby from the first, and the administration of one-grain doses of bromide of potassium at short intervals. The infant death-rate on the island of St. Kilda has, consequently, been much reduced. The author suggests the use of a new iodine preparation called loretin for dressing the cord. The powder is free from odor and is non-poisonous.

NEUROLOGY.

IN CHARGE OF LANDON CARTER GRAY, M.D.,
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AND

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Tumors of the Spinal Cord. (*American Journal of the Medical Sciences*, June, 1895.) By M. Allen Starr, M.D.

The author has collected one hundred and twenty-three cases of tumor of the cord and twenty-two cases of successful localization of the tumors with removal. The latter list includes three cases of his own. In the diagnosis of these cases, the earliest and most important symptom is pain, located usually in the peripheral termination of the nerve-root which is first compressed by the growth of the tumor. Thus, in the majority of cases, the pain has been referred to the epigastrium, or to the abdominal region, or to the legs or arms, rather than to the spine itself. The pain is of a severe neuralgic character, is sometimes described as a burning pain, and as it increases appears to shoot along the course of the nerve which is implicated. The pain is unilateral at first, and soon becomes bilateral as the tumor grows,—an important point in diagnosis. The histories of a large majority of cases show that the pain is rarely, if ever, limited to one side of the body in the stage when paralysis has developed, because when the tumor is large enough to compress the entire spinal cord, it has necessarily invaded the posterior nerve-roots on both sides, and hence pain on both sides of the body is inevitable. The exact situation of the initial pain is of much importance in locating the position of the tumor. In the exceptional cases, where pain is felt in the spine, it is commonly located one or two inches below the seat of the tumor. There appears to be no case of spinal tumor on record in which there was tenderness along the nerves in which the pain was felt, an important distinguishing point as regards neuralgia or neuritis. In the latter affections also, motion of the limbs or of the body in respiration will usually increase the pain, while in spinal tumor, if the pain is produced by any movement, it is a movement which involves flexion or rotation of the vertebræ.

Tumor of the Corpus Callosum, with Autopsy. (*American Journal of the Medical Sciences*, June, 1895.) By Richard P. Francis, M.D., M. Allen Starr, M.D., and Ira Van Gieson, M.D.

The patient was a woman aged forty-five years. The initial symptoms occurred fifteen months before death, and consisted of attacks at intervals of from six weeks to two months, in which she suddenly became semi-conscious and restlessly moved her hands and turned her head. On the following morning there would be some complaint of headache and general feeling of exhaustion, while the mind seemed slightly clouded. Four

months before death the patient was totally blind, owing to double optic neuritis and hemorrhage into the right retina. The right pupil was dilated and there was right internal strabismus; pupil reflex absent on both sides; no ptosis. The tongue was protruded in the median line and there was no drawing of the face. There were no tender spots on the head, no anæsthesia or hyperæsthesia, and no headache. Vomiting was present with progressive mental dulness and emaciation, but no paralysis of any of the extremities. Diagnosis: tumor of the brain, but not located. It was found, *post mortem*, to be a gliosarcoma or neuroglioma lying between the two hemispheres, merging into their tissues on either side and with no distinct capsule, but rather growing into the frontal lobes equally.

Round-Cell Neurosarcoma of the Brain. (*Maryland Medical Journal*, June 1, 1895.) By Louis Mackall, Jr., M.D.

The patient at the age of eight injured his head by striking it severely against an iron projection. Two years later vomiting, headache, diplopia, and staggering gait were observed. He had numbness in left hand and foot and lost sight in the left eye, and later had optic atrophy of both eyes. Gastric crises continued with vertigo and slight convulsive movements, followed by loss of power in the right arm and hand six months before his death. For nearly a year he was deaf in his right ear. After death a tumor the size of a hen's egg was found almost entirely free, lying between the cerebrum and the cerebellum.

Three Cases of Hereditary Rumination. (*Boston Medical and Surgical Journal*, May 23, 1895.) By Edward C. Runge, M.D.

These patients belonged to three generations in the male line. The author subjected the contents of the stomach of one patient to quite an extensive analysis, but without finding any abnormality of secretion, and admits that to call it a "neurosis" shelves the difficulty but does not overcome it.

Two Cases of Raynaud's Disease Occurring in James Murray's Royal Asylum, Pesth. (*Edinburgh Medical Journal*, March, 1895.) By Alexander Reid Urquhart, M.D., F.R.C.P. (Ed.).

The first case occurred in the person of a man, aged thirty-three, suffering from delusional insanity. He presented a family history of rheumatism with a personal history of yellow fever, hæmatemesis, and hæmatoma auris. During residence in the asylum he presented symptoms of gangrene of both feet, and subsequent microscopical study of the tissues showed no central or peripheral nerve lesion or area of degeneration. The toes did not present the appearance of ordinary gangrene. There was blood everywhere between the skin and the bone. The blood-vessels, especially the veins and capillaries of the subcutaneous tissues, were all greatly engorged, some of them forming large sinuses. There was not much diapedesis, the ap-

pearance of hemorrhage to the naked eye being due to the great engorgement of the blood-vessels. The structure of the vessels was normal. The second case occurred in the person of a female patient, aged fifty, suffering from melancholia following influenza. In this case there was an hereditary predisposition to insanity, motor excitability, marked trophic changes, and hæmatoma auris. The congestion involved both feet; but cleared up leaving no marks, nor has there been any return of congestive symptoms. Both cases presented "dead fingers." The local changes in these cases cannot be explained by mechanical obstructions of the vessels nor by the occurrence of peripheral neuritis. The disease is probably, as Raynaud opined, a neurosis characterized by enormous exaggeration in the activity of the central gray parts which control the vaso-motor innervation. The occurrence of dead fingers points to a condition of vascular spasm.

Reflex Epilepsy of Nasal Origin. (*Revue de Laryngologie, d'Otologie, etc.*, May 15, 1895.) Siethoff reports two cases. The first was that of a man thirty-eight years of age, who had suffered from epileptic attacks for twenty years. Each year the attacks grew longer and harder, and were accompanied by loss of consciousness, biting of the tongue, and clonic spasm of the extremities. Rhinoscopical examination showed hypertrophy of the inferior and middle turbinated bodies and of the crest of the cartilaginous septum.

The writer prescribed an application of a ten-per-cent. solution of cocaine to the hypertrophied parts. This was applied by the man's wife. It proved successful in aborting a threatened attack. He then treated the nasal mucous membrane with the galvano-cautery, which lessened the frequency of the attacks and finally caused their complete cessation.

The second patient was a man thirty-three years of age. He suffered for a long time with slight attacks of epilepsy. In January, 1892, he had the first violent fit, which was accompanied by a sensation of terrible fetidness persisting for eight days. Since that time the patient has had similar attacks every five weeks at first, then every three weeks, which were always accompanied by an olfactory aura lasting sometimes for four days. The right inferior and the middle turbinated bodies were equally hypertrophied and pressed against the septum, causing entire occlusion of the nostril. The introduction of a tampon of cocaine quickly modified the physiognomy of the man, who said that the odor had disappeared. After treatment of long duration the hypertrophied parts returned to a normal condition. The patient has had only occasionally a suspicion of the old odor, the epilepsy has disappeared, and his appearance has completely changed.

DERMATOLOGY.

IN CHARGE OF W. A. HARDAWAY, A.M., M.D.,
Professor of Skin-Diseases in the Missouri Medical College, St. Louis;

ASSISTED BY

C. F. HERSMAN, A.M., M.D.,
St. Louis.

Urticarial Asthma the Result of Mussel-Poisoning. (*British Medical Journal*, June 8, 1895.) By Gilbert Martyn, M.B.

A woman, aged forty-three, who said she had eaten about a dozen mussels for her supper, began to feel a choking sensation and great difficulty in breathing, about an hour after eating. A "nettle-rash" appeared on her body at the same time, which caused great itching. She soon threatened to become asphyxiated, and was given warm water. After expectoration of a little tenacious mucus, her breathing became slightly better. She was then taken to the Middlesex Hospital, and on her arrival was still cyanosed, the extremities cold, the breathing labored and typically asthmatic. The urticarial rash was present over nearly the whole body. After the stomach and bowels were emptied and stimulants were given, the patient was much relieved and was able to go home in about three hours. She had never had asthma before.

The author reports this case as one which indicates clearly the relationship of urticarial eruption of the skin to that of the mucous membrane, which was so strongly advocated by Sir Andrew Clark as the main cause of asthma. He does not find instances on record of the concurrence of urticaria of the skin and of the mucous membrane as the result of a common cause.

Two Cases of Carbolic Acid Coma induced by the Application of Carbolic Compresses to the Skin. (*Lancet*, June 1, 1895.) By R. Clement Lucas, F.R.C.S., and W. Arbuthnot Lane, F.R.C.S.

The application of a compress of lint soaked in a five-per-cent. solution of carbolic acid in water has been used for disinfection of the skin in the neighborhood of an operation as a routine practice in Guy's Hospital. Among the hundreds of patients who have been thus prepared for operation, only two have presented symptoms of serious import. Headaches, nausea, and carboloria have been occasionally noted, but in these two patients coma lasting several hours was induced before the operation was attempted. This peculiar susceptibility to phenol-poisoning must be of rare occurrence, or it would have been noticed earlier among the large number of patients treated in this manner. In the first case, that of a boy fifteen years of age, the carbolic compress was applied at noon over the right thigh. In the evening he became very sick, and at 2.30 A.M. was in a comatose condition. The breathing was very stertorous; the pulse,

which could not be counted at the wrist, was 200; the pupils were small, reacting slightly to light; there was no corneal reflex. He was in a profuse perspiration all over. Brandy and strychnine were given at once, but produced little effect. After a time he gradually came to some perception of stimuli and cried out when the limbs were pinched, but did not move much. At 10 A.M. he was still comatose, the pulse was 120 and feeble. A half-hour later he became perfectly conscious. Urine passed at this time was very dark in color. Two days later he still felt sick and vomited occasionally, the pulse was 126, and the evening temperature was 103.4° F. He recovered entirely, however, in about four days.

The second patient, a boy, one and one-half years old, was suffering from a swelling in the right inguinal region which was to be explored. A compress moistened in a carbolic lotion, one to twenty, was applied at 12.20 P.M. At 1.30 P.M. the child groaned, and in a few minutes became pale, collapsed, and comatose. There were marked dyspnoea and convulsive twitching of the eyelids and limbs. The pulse was 130, feeble and intermittent, the respirations 72, and temperature 97° F. Ether and atropine were given hypodermically and brandy by the rectum. Blankets and hot bottles were applied and the interrupted current used. The patient soon became somewhat better, but vomiting and carboluria persisted for several days.

Case illustrating the Neurotic Origin of Hydrocystoma. (*British Journal of Dermatology*, May, 1895.) By Jonathan Hutchinson, F.R.S.

Under the name of hydrocystoma, Dr. A. R. Robinson, of New York, has described a peculiar eruption on the faces of some women in middle and advanced life. He believes this disease to be due to exposure of the face to warm vapor and to profuse local sweating. He has seen thirty or forty examples of it since 1884. All of his patients had been engaged in occupations which caused much sweating, and all were worse in summer than in winter. The eruption consisted of tense, clear, shiny vesicles, varying in size from a pin-head to a pea, scattered over the face. These vesicles contained a clear fluid which never became yellow, and always had an acid reaction. By microscopical examination, he demonstrated that the secreting portion of some of the sweat-glands was dilated, but the other structures of the skin were healthy. His conclusion is, therefore, that the cysts result from some obstruction in the excretory tube which prevents the outflow of sweat. Hallopeau, of Paris, has described a case in which the eruption was limited to the nose and was more profuse at the menstrual period. He conjectured that the condition was much under the influence of the nervous system. Dr. Jamieson, of Edinburgh, has also described a case in which the eruption was confined to the right side of the nose. The patient perspired freely on the right side of the body and but seldom on the left. Mr. Sequeira's patient, the one about to be described, repeats almost exactly the condition described by Dr. Jamieson, and both of these and Dr. Hallo-

peau's case give support to the opinion that the condition is influenced by the nerves supplying the part.

Mrs. C., a sextoness, aged fifty-four, apparently in good health. She married at the age of twenty-three, and at that period was subject to fearful headaches which sometimes lasted for twenty-four hours and were always worse on the right side. These headaches have diminished in frequency but are still severe when they occur. Of late years she has a neuralgia of the tongue which is almost constant and much worse on the right side. It began by loss of taste on both sides of the tongue, but she recovered from this about six months ago. She says that her mother had chalky gout and that she herself has had attacks of pain in her great toe.

The little cysts on the face have been present for eight or ten years and are much more abundant on the right side. They are found especially on the region around the eyelids, on the lower lid, the outer two-thirds of the eyebrow, the adjacent part of the forehead on both sides, and on the bridge of the nose.

There cannot be much hesitation in admitting that in this case the life-long liability to hemicrania has had something to do with the disturbance in function and nutrition of the skin. The cysts, the sweating, the pain in the tongue, and the hemicrania predominate on the right side, although they are not entirely restricted to it. The right fifth nerve has been more severely affected throughout than its fellow. The headaches are probably neuralgic in character, for they have never been attended by jaundice or nausea. The neuralgia in the tongue is very much like that which occurs in many cases of gout.

Herpes Zoster accompanied by Paralysis of the Auditory and Facial Nerve. (*Australasian Medical Gazette*, May 15, 1895.) By J. Lockhart Gibson, M.D.

In the case of herpes zoster cited, which attacked the region of the auricle, three varieties of nerves were involved,—viz., those of ordinary sensibility, those of special sensibility, and motor nerves.

The patient, a man fifty-nine years old, complained of severe shooting pains about the ear, on the right side of the head, which were increased by frequent severe paroxysms. Four days after the commencement of the neuralgic pains he noticed an eruption below his ear. He said he had a fall from his horse, hurting the back of his head, ten days before the onset of the attack.

The eruption extended from the right suprasternal notch over the right thyroid region, and into the beard under the lower jaw, stretching upward over the mastoid region, behind and close to the auricle, and on to the scalp. All this region is supplied by nerves which take their origin from the second and third cervical nerves, and includes almost the whole area supplied by the superficial cervical nerve, part of that supplied by

the great auricular, and part of that supplied by the small occipital nerve and its mastoid division.

Phosphide of zinc, in one-fourth grain pills, was given every three hours while the patient was awake. The eruption was painted with flexible collodion. Two days afterwards, antipyrin—ten grains—was ordered at night, in the hope of inducing sleep, and, this failing, sulphonal—fifteen grains—was substituted, with a satisfactory result. On the sixth day of treatment, the eruption was drying up, the pain had abated, but the patient complained of a beating noise in his right ear and of hearing badly. There was evidence of chronic middle-ear catarrh in both ears. The hearing was very deficient on the right side, being $\frac{1}{8}$ of natural, and moderately so on the left side, half of normal. There was slight general facial paralysis.

At this time he left town for ten days. On his return, he said that the facial palsy had increased for the first few days after leaving town, but disappeared very rapidly after the first week. The singing in his right ear had lessened. The hearing improved rapidly under the employment of the induced current, but has never returned to normal. The auditory nerve was apparently involved in the nerve lesion. The diminished hearing could hardly be due to paralysis of the tensor tympani, partly because this last is supplied through the otic ganglion by the fifth nerve, and chiefly because the tuning-fork gave no indication of the deafness being of a conductive nature. Implication of the facial nerve is also rare and interesting. The persistence of part of the auditory nerve paralysis, and of some of the tinnitus aurium, seems parallel to the anæsthetic areas and to the persistence of neuralgic pain after some cases of intercostal zoster.

PATHOLOGY.

IN CHARGE OF ALLEN J. SMITH, A.M., M.D.,

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AND

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The Variability of the "Comma Bacillus" and the Bacteriological Diagnosis of Cholera. (*Journal of Pathology and Bacteriology*, April, 1895.) By Sheridan Delépine, M.D. (Edin.), and James Richmond, M.A., M.B. (Oxon.).

Since Koch's discovery, in 1884, the basis of the diagnosis of cholera has become more and more bacteriological, and during the last few years more importance has been attached to the discovery of the comma bacillus than to the epidemiological and clinical features on which, previously, the

diagnosis of Asiatic cholera had rested. At the same time, it has been discovered that the disease has apparently become endemic in several countries, and that small, insignificant outbreaks have occurred in places widely distant from each other. One may logically ask, has the disease altered in type or have we, by our new diagnostic methods, discovered a prevalence of cholera hitherto unsuspected? Again, while the proportion of cholera cases in which the comma bacillus has been found has become greater, the differential characters by which this organism can be distinguished from allied vibrios have become fewer and less distinct. These considerations lead one to ask which is the variable element—the disease or the diagnosis? In reviewing the literature of the subject, it has been found: first, in various epidemics of cholera, choleraic cases have been described in which cholera spirilla have not been found. Second, when cholera is epidemic, cases without any symptoms of cholera may occur in which cholera bacilli are found in the stools. Third, the drinking water has been found to contain bacilli resembling the cholera bacilli in several places where epidemic cases of cholera had occurred. Fourth, cases are reported in which comma bacilli, like Koch's, have been found in the drinking-water or sewage of communities which were not suffering from cholera at the time. Fifth, the cholera bacillus varies in different epidemics, in different places, in various cases, and in the same case. A synopsis of five cases of choleraic disease occurring at Manchester, in 1893, is given. Conclusions:

1. With other observers we come to the conclusion that, by the application of a certain number of tests, it is pretty easy to identify cholera vibrios in the stools of patients suffering from a choleraic attack, when such vibrios are present.

2. These vibrios, however, vary to a considerable extent in their pathogenic, zymogenic, and chromogenic properties, and we have evidence that this is true not only when they grow saprophytically outside the body, but also when they are obtained directly from the intestine of a choleraic patient.

3. It seems to us that the value of statistical returns, based on the bacteriological investigations of observers who ignored these variations, must be considered as giving us only part of the truth; because these observers must have considered many cases as free from cholera bacilli when these bacilli, though present, had assumed abnormal characters.

4. On the other hand, we are gradually led to recognize as cases of cholera many cases which formerly would not have been recognized as such.

5. Bacteriological diagnosis has not therefore, up to the last two or three years, given us the means of obtaining perfectly comparable data.

FORENSIC MEDICINE.

IN CHARGE OF LORENZO D. BULETTE,
Of the Philadelphia Bar.

CONFIDENTIAL COMMUNICATIONS OF PATIENT TO PHYSICIAN PRIVILEGED IN CIVIL CASES IN PENN- SYLVANIA.

THE confidential communications made by a patient to his physician have hitherto been subject, in Pennsylvania, to the rule of common law, which requires a disclosure by the physician of such communications when they become material as evidence in the course of a legal proceeding. But the severity of this rule was partially relaxed by an act of Assembly, entitled "An act to prevent physicians and surgeons from testifying in civil cases to communications made to them by their patients." This act was approved, and became a law, June 18, 1895, and is in the following words: "That no person authorized to practise physic or surgery shall be allowed in any civil case to disclose any information which he acquired in attending a patient in a professional capacity, and which was necessary to enable him to act in that capacity, which shall tend to blacken the character of the patient, without his consent."

For the information and guidance of physicians in Pennsylvania, until opportunity presents for the interpretation of this act by the courts of that State, it may be helpful briefly to digest the decisions by courts of last resort in other States, interpreting statutes having the same object and expressed in the same words as the above enactment, to the following requirements of which attention is specially directed: The person must be duly qualified to practise medicine; the privilege extends to testimony in civil cases only; the information privileged includes communications from the patient as well as that acquired by the physician himself through any of his senses; but such information is subject to two conditions: it must have been acquired while in *professional* attendance on the patient, and further, it must be such information as is necessary to enable him to prescribe; the privilege belongs, not to the physician, but to the patient, by whom it may be claimed during his life, or by his personal representatives after his death; or the privilege may be waived by the patient, and by him only when given to him in express terms.

The person in behalf of whose testimony the patient will invoke the privilege of the statute must be a practitioner qualified to practise medicine

under the Medical Act, 1893, or the acts previously in force; or he must be one who is within their exceptions. A consultant called in by, or at the request of, the attending physician for the purpose of a consultation, is within the statute. And the patient may claim the privilege in respect of any number of physicians called in at different times; or he may waive the privilege as to one and retain it as to the others.

The information contemplated by the statute is not confined to communications made by the patient to his physician, but it includes and protects, with the veil of privilege, whatever, in order to enable the physician to prescribe, was disclosed to any of his senses, and which in any way was brought to his knowledge for that purpose. Accordingly, information acquired by the physician through his sense of sight is as fully within the statute as if it had been orally communicated, and information obtained from observation of the plaintiff's appearance and symptoms cannot be disclosed.

When a party seeks to exclude evidence under this statute, the burden is on him to bring the case within its provisions. He must make it appear, if it does not otherwise appear, that the information which he seeks to exclude was not only such as the witness acquired in attending the patient in a professional capacity, but he must also show that it was such as was necessary to enable him to act in that capacity. If the physician has acquired any information which was not necessary to enable him to prescribe, or to act as a surgeon, such information he can be compelled to disclose, although he acquired it while attending the patient; and before the exclusion is authorized, the facts must in some way appear upon which such exclusion can be justified.

"It will not do," says the New York Court of Appeals, "to extend the rule of exclusion so far as to embarrass the administration of justice. It is not even all information which comes within the letter of the statute which is to be excluded. The exclusion is aimed at confidential communications of a patient to his physician, and also such information as a physician may acquire of secret ailments by an examination of the person of the patient. The policy of the statute is to enable a patient, without danger of exposure, to disclose to his physician all information necessary for his treatment. Its purpose is to invite confidence and prevent a breach thereof. Suppose a patient has a fever, or a fractured leg or skull, or is a raving maniac, and these ailments are obvious to all about him, may not the physician who is called to attend him testify to these matters? In doing so there would be no breach of confidence, and the policy of the statute would not be invaded. These, and other cases might be supposed, while perhaps within the letter of the statute, would not be within the reason thereof. *Cessante ratione legis, cessat et ipsa lex*. Therefore, before information sought to be obtained from physicians as witnesses can be excluded, the court must know somewhat of the circumstances under which it was acquired, and must be able to see that it is within both the language and the policy of the law."

The privilege must be claimed at the time the testimony is offered ; the person entitled may not sit by during the examination of the physician, and, after finding that his testimony is injurious, claim the right under the statute to have such testimony stricken out. There are bounds to the enforcement of the provisions of the statute which will not be disregarded at the instance of a party who, being entitled to their benefit, has waived or omitted to avail himself of them. The privilege claimed and the proposed evidence must be seasonably objected to. The rule of evidence, which excludes the communications between physician and patient, must be invoked by an objection at the time the evidence of the witness is given. It is too late after the examination has been insisted on, and the evidence has been received without objection, to raise the question of competency by a motion to strike it out.

The privilege secured by the statute is for the benefit of the patient, and for the sole purpose of enabling him, when in need of medical or surgical aid, to make a full disclosure of the facts of his condition without fear of a betrayal of such confidence. But the patient who does not wish to avail himself of the privilege may waive the same, since the public are not concerned in the suppression of such information when there is no desire on the part of the patient, whom it directly concerns, for its suppression ; and the privilege once waived is waived for all time and in any subsequent proceedings.

Though the patient himself may waive the privilege and permit the physician to testify, the question may yet arise whether this right of waiver is confined to the patient alone, and may not be exercised by his executor or administrator after his death, as the patient might have done. Accordingly, where the terms of the statute gave the right of waiver to the patient, it was said that "the purpose of the law would be thwarted, and the policy intended to be promoted thereby would be defeated, if death removed the seal of secrecy. Whenever the evidence comes within the purview of the statutes, it is absolutely prohibited, and may be objected to by any one, unless it be waived by the person for whose benefit and protection the statutes were enacted. After one has gone to his grave the living are not permitted to impair his fame and disgrace his memory by dragging to the light communications and disclosures made under the seal of the statutes."

BOOK REVIEWS.

PRACTICAL URINALYSIS AND URINARY DIAGNOSIS: A MANUAL FOR THE USE OF PHYSICIANS, SURGEONS, AND STUDENTS. By Charles W. Purdy, M.D., Queen's University. Philadelphia: The F. A. Davis Company, publishers. London: F. J. Rebman.

This is a work of 357 pages. It is divided into two parts, the first of which treats of the examination and analysis of both normal and abnormal urines; the second, of urinary diagnosis and diseases of the urinary organs and urinary disorders.

In looking over the chapters on the examination of the urine, the reader finds that the various methods of chemical examination are stated in clear and concise language, and stress laid upon the practical points of the process. The writer insists upon the fact that urine passed several hours after meals, and not upon rising, is the proper one for morbid examination; that lower specific gravity, with a normal quantity, should always be regarded as suspicious of renal defect.

For the detection of albumin, Dr. Purdy considers the ferrocyanic test the most simple and least liable to error in routine work. For minute quantities of albumin, he recommends the potassio-mercuric-iodide solution (Tanret's) as most desirable. Picric acid, acidulated brine, trichloroacetic acid, and many other recently lauded reagents are considered unreliable. His objection to Heller's test (nitric acid) is based on the fact that mucin is apt to be precipitated by the diluted acid just above the point of contact with the urine, and consequently gives a reaction when no albumin is present.

For the detection of sugar, the author uses the solution devised by Haines, of Chicago. This consists of pure copper sulphate, 30 grains, distilled water, $\frac{1}{2}$ ounce; a solution is made and $\frac{1}{2}$ ounce of pure glycerin is added; this is then thoroughly mixed and 5 ounces of liquor potassæ are added. This solution keeps indefinitely, and is considered preferable to Fehling's, which is unstable. This latter objection does not appear good, as the two solutions constituting the Fehling reagent can be kept separately and mixed as needed.

The key-note of this part of the book is struck when we come to the examination of the organic and inorganic constituents of the urine (Section VI.). A short and modest description of the author's electrical centrifugal machine is given. By the use of this apparatus, with its graduated tubes, the estimation of the chlorates, sulphates, and phosphates can rapidly be made, as can also the estimation of the quantity of albumin and the examination for casts, blood, etc., be much expedited. The writer of this review can heartily endorse the author's statements as to the advantages of this method of examination over the tedious custom of allowing the urine to stand so many hours before the microscopical examination. All institutions and laboratories should be equipped with some such apparatus.

The second part of the book, on urinary diagnosis, is especially useful to students and the younger medical men. The condition of the urine in disease is detailed, the leading clinical symptoms in the case given, and differential diagnosis made. The sections on diseases of the urinary organs are well worth the reading by all medical men.

There is an appendix upon the examination of the urine for life-insurance. It is timely and to the point.

The book is well printed and contains but few errors. The writer uses the word cancer for all forms of malignant disease. Thus, on page 269, in a paragraph on renal cancer is found the following statement: "Primary cancer of the kidney may appear in the form of carcinoma, sarcoma, and rarely as lymphadenoma." Again, on page 123, it is stated, "Acetonuria is frequently associated with certain forms of cancer, notably carcinoma." This is certainly not a scientific nomenclature.

On page 132, Huppert's test for bile pigments in the urine is detailed differently from that found in Von Jaksch, on page 289, edition of 1894.

Mention is made of the catheterization of the female ureters as an aid in diagnosis. The same procedure in the male, which has been successfully performed by Brown, of Baltimore, is not referred to.

The index is not as complete as it should be, and some time is lost in hunting your page.

Finally, the illustrations, which are numerous and well done, are mainly taken from other works on similar topics, especially Peyer and Von Jaksch; the value of the book warrants original illustrations. It is well up to date in most points, but the subject of cylindroids is passed over in about ten lines, and but little attention is paid to the albuminuria of uric acid and oxaluria (*Morbus Dacostæ*).

This book is heartily recommended as a useful guide in urinary work.

J. A. S.

SUGGESTIVE THERAPEUTICS IN PSYCHOPATHIA SEXUALIS; with Especial Reference to Contrary Sexual Instinct. By A. von Schrenck-Notzing (Munich, Germany). Authorized translation from the German by Charles Gilbert Chaddock, M.D., Professor of Diseases of the Nervous System, Marion-Sims College of Medicine, St. Louis. One volume, royal octavo, of 325 pages. Extra cloth, \$2.50 net; sheep, \$3.50 net. Sold only by subscription to the medical profession exclusively. Philadelphia: The F. A. Davis Co., Publishers, 1914 and 1916 Cherry Street.

The world has but little use for books of this character, as they do more harm than good. Lately we heard a prominent physician express his opinion that a former work on the same subject would increase in America the character of the trouble which it was ostensibly attacking. Now comes along a book with the object of quenching the fire that the spark may have kindled. We rather consider it of a combustible character, that can but add fuel to the flame. At a recent meeting of the Philadelphia Neurological Society a paper was read upon Sexual Perverses, and the author was mildly criticised for the selection of his topic. Ordinarily, we would agree with the critic, but all of the seven subjects chosen as illustrative cases were confined in the Eastern Penitentiary of the State of Pennsylvania,—an object lesson from which some may derive benefit.

H. W. C.

SYLLABUS OF GYNÆCOLOGY, BASED ON THE AMERICAN TEXT-BOOK OF GYNÆCOLOGY. By J. W. Long, M.D., Richmond. Price \$1.00 net. Philadelphia: W. B. Saunders, 1895.

An interleaved book of 133 printed pages, whose object is to furnish lecture-notes for students, as well as a ready reference for practitioners. It consists of tabular condensation of the American Text-Book of Gynæcology as representing the most advanced thought in this particular line. By a reference mark at the bottom of each page the subjects can be quickly found in the text-book itself. The volume is neatly built, and not too large for the pocket.

W. H. P.

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ORIGINAL COMMUNICATIONS.

ETIOLOGY OF IDIOPATHIC HYPERTROPHY OF THE HEART.

BY JAMES T. WHITTAKER, M.D.,

Of Cincinnati.

THE recognition of hypertrophy of the heart during life dates from the discovery of Avenbrugger, whose *Inventum Novum*, published in 1761, made it possible by percussion to outline the limits of the heart. This discovery, *inter tædia et labores* (every writer knows the phrase and appreciates the fact), found no general acceptance until the unknown or forgotten work of the obscure country practitioner was resuscitated by the brilliant Corvisart, who recognized its worth and published it in French, in 1811. By the use of this means of study, Corvisart was able, as he declared, to diagnose hydrops pericardii (*i.e.*, chiefly pericarditis) and aneurism of the heart, by which term was then understood what we now know as dilatation. It was only by the time of Stokes (1850) that it began to be possible to separate these conditions. Every clinician then became familiar with the hypertrophy which occurred in the course of valve lesions, and with the dilatation consecutive to the hypertrophy.

But as long ago as 1827, Richard Bright had called attention to the enlargement of the heart which occurred in the course of disease of the kidneys, and in 1856 Traube, who made a special study of this subject, pointed to enlargement of the heart as a sign of Bright's disease. The study of the cause of this relationship, or of the dependence of hypertrophy of the heart upon occlusion in the kidneys, led directly to the recognition of arterio-sclerosis, or, as it was called later by Gull and Sutton, arterio-capillary fibrosis, as a condition which puts obstacles in the way of

the circulation, and leads as a mechanical consequence to hypertrophy of the heart.

Hypertrophy of the heart in the course of pregnancy was noticed first by Larcher, in 1859, and the condition seemed to be established by the French observers, especially by Menière and Jacquemier. But Gerhardt threw doubt upon the existence of hypertrophy in this condition by attributing the increase in dulness to the higher position of the diaphragm and protrusion of the heart against the wall of the chest. The objections seemed to have been verified by Löhlein, so that there was a general inclination to surrender the view until it met with renewed support by Bollinger in 1893. Since Bauer (1860) reported a number of cases of simple hypertrophy, and Da Costa (1867) noticed the effects of irritation of the heart in army life, the fact that the heart may undergo hypertrophy independent of any obstacle to the circulation in the heart itself—that is, independent of any valve lesion—has been universally established.

These cases of enlargement of the heart, in which the increase in volume cannot be attributed to any obstacle in the heart itself, are inappropriately distinguished as idiopathic hypertrophies. The term is a misnomer, from the fact that in most cases the cause of the condition can be determined as something which raises the blood-pressure, and in this way opposes the work of the heart. In certain cases the cause of hypertrophy remains concealed; these cases may be called cryptogenetic, but in no case may the hypertrophy be considered as essential autochthonous or idiopathic; these are all terms which should be abolished in the etiology of disease. The expression peripheral hypertrophy is too inexact, and hypertrophy from peripheral cause is too elastic. But the term idiopathic hypertrophy has become so thoroughly incorporated into the history of heart-disease as to justify the use of it now as something generally understood.

As observations multiply it is seen that this so-called idiopathic hypertrophy, so far from being rare, is common. A number of cases were reported in the beginning of the seventh decade of this century by Meyer, Da Costa, Clifford Allbutt, and Thurn. Fraentzel reported nineteen cases of dilatation and hypertrophy which occurred in consequence of the strain of the campaigns of 1871. Schmidbauer and Athmann found the affection very frequent in Munich. In fact, the condition has now become so common that while in older text-books this hypertrophy was given but scant description, it is now allotted greater length than hypertrophy from valve-disease.

It would be inexcusable to occupy the time of this assembly with any anatomical statements regarding the measurement of the heart, or questions of multiplication of its fibres, or with any citation of remarkable cases. These interesting subjects do not belong to this discussion. I may repeat, only to freshen the memory, that the heart of a man weighs on the average about nine ounces, of a woman eight ounces; that anything over twelve ounces in a man and over ten ounces in a woman constitutes hypertrophy; that Stokes recorded a heart that weighed sixty ounces; that clinicians call

a heart hypertrophied (or dilated) when the apex is dislocated to the left of the mammillary line, or the right border can be recognized to the right of the right border of the sternum ; but that they must often make a diagnosis without the aid of percussion, which is too coarse for the appreciation of subtle changes ; finally, that nothing is so deceptive as the so-called triangulation of the heart.

From an etiological stand-point, hypertrophies of the heart may be divided into the following groups :

1. Hypertrophies due to obstacle in the heart itself. This condition is typically represented by lesions of the valves.
2. Hypertrophies due to increased resistance in the vascular system.
3. Hypertrophies due to diseases of the heart muscle itself, from infection, overstrain, degeneration, etc.
4. Hypertrophies due to affection of the nervous system.

The hypertrophy which occurs in consequence of valve-disease has an obvious cause. Forget speaks of this hypertrophy as a *retrohypertrophy*, and compares it to that which occurs in the bladder in the face of an obstacle in the urethra, that of the stomach which occurs in an obstruction at the pylorus, or in the œsophagus or intestine behind strictures. This hypertrophy is, therefore, in no sense idiopathic.

Germain Sée called attention to a hypertrophy of growth, which he describes as a precocious development of the heart under a tardy development of the thorax. This disproportion disappears with age, but, if it should precede it, entails interference with the pulmonary circulation and hypertrophy of the right heart.

Bloch set out to establish the reality of this hypertrophy of growth, but retreated and took refuge in the hereditary predisposition. This predisposition shows itself in children of tuberculous, alcoholic, and neuropathic parentage. The children in these cases showed degenerated hearts, and hypertrophy set in as early as the age of seventeen years.

Next comes the question of the condition of the heart in pregnancy.

Ducrest took the trouble to measure the heart in one hundred women, aged twenty to thirty years, who had died in puerperium, and found that the wall of the ventricle was distinctly and decidedly thickened. Thus, Bizot had fixed the average thickness of the ventricle in women at 0.010 metre. Ducrest found it in puerperium varying from a minimum of 0.011 to a maximum of 0.018 metre. This difference constitutes a real hypertrophy, but it cannot be recognized by percussion.

On the other hand, Löhlein weighed the hearts of nine women, of varying sizes,—large, medium, and small,—in puerperium, and found the average to be 245 grammes ($7\frac{3}{4}$ ounces). This weight corresponded exactly with that fixed by Clendennin in healthy women of average weight from the twentieth to the sixtieth year of life.

As already remarked, the claim made by Larcher and supported by a number of French observers, that the heart undergoes hypertrophy in

pregnancy, was doubted by Gerhardt and seemed to have been overthrown by Löhlein, but was re-established by Bollinger with an accurate study of 76 cases (1879-1890), in 67 of which the weight of the heart was established post mortem. Of these 67 cases, 9 died during pregnancy, 7 on the day of labor, 32 in the first week, 14 in the second, 1 in the third, 3 in the fourth, and 1 in the fifth week. Accurate measurement showed that the heart increases in weight in pregnancy. The hypertrophy is most marked in young life, least in emaciated women. The increase in weight during pregnancy, 8.8 per cent. of the normal weight, corresponds to the increase in weight of the body of the mother, including the foetus. Dreysel showed that the increase affected both ventricles and concerned the thickness of the walls as well as the diameter of the cavities. This increase continues uninterrupted from the first months of pregnancy up to the day of labor. Then follows a reduction, rapidly at first, more slowly later. The cause of the hypertrophy is to be attributed to the increased work thrown upon the heart in supplying the mammæ, the uterus, and the placental circulation. Moreover, pregnancy increases the quantity of blood. This fact was demonstrated by Spiegelberg and Gescheidler in the case of pregnant dogs, and by Heissler in the case of pregnant sheep, in which animal the increase is nearly one-fourth of the physiological quantity of blood.

Henning was able to make an exact demonstration of hypertrophy of the heart which developed in consequence of a myoma uteri. This author also reported four cases in which palpitations and tumultuous action subsided after removal of tumors of the uterus.

Next must be considered the hypertrophy of work. Studies in comparative anatomy show that the size of the heart increases in proportion to the muscular effort. Bollinger made a number of these investigations, showing that animals which have to furnish enormous muscular power, and certain birds distinguished by velocity and long duration of flight, are endowed with larger development of the heart muscle. The smallest heart among birds is found in the heathpout, 4.09 per thousand. This animal lives a quiet and comfortable life on the earth. The buzzard, a lazy bird of prey, which only hunts mice, etc., shows 8.02 to 8.30 per thousand heart-weight. The goose shows 8, the partridge 9.17, and the weight rises through the scale according to the velocity and duration of flight, up to the thrush, whose heart weighs 25.6 per thousand. The horse, dog, chamois, hare, and deer show relatively heavy hearts. That of the deer, for instance, is twice as great as that of man. Miller proved that hypertrophy chiefly concerns the muscle of the left ventricle in draught, running, and hunting dogs in consequence of excessive bodily strain. The same increase in volume occurs in man in correspondence with the character of the work. Thus, Bauer called attention to the hypertrophy of the heart in the woodcutters of the mountains, the mountain climbers, hunters, etc.

Germain Sée speaks of the hypertrophy of the heart in workingmen as

the *cœur du travail*, which he observed in vocations requiring a sustained effort, as in blacksmiths, porters, musicians who play wind instruments, soldiers under forced marches, etc. Excessive or sustained contraction strains the heart and interrupts the circulation of the blood, but this evil is counteracted by the dilatation of the vessels which take place in exercise. Oliver's studies with the arteriometer illustrate the feeding of the brain and body by this process. The gymnast, the ball-player, and the bicycle-rider furnish a contingent of cases of excessive muscular contraction, and often of heart-strain, hypertrophy, and exhaustion.

Disregarding now congenital contraction of the aorta—fine cases of which, recognized in life, are reported by Fraentzel and Penzoldt—hypertrophy from increased resistance in the vascular system may be introduced by the study of the effects of plethora. The quantity of blood is directly increased after every meal, as but a small proportion of the ingesta escapes directly from the body through the emunctories. Where the processes of life are active, the consumption corresponds to the ingestion, and the weight of the body remains practically the same. But when the mode of life is more inactive or sluggish, the quantity of blood accumulates to constitute the condition of true plethora. The blood corpuscles may increase in number from four million to seven million to the cubic millimetre, and the hæmoglobin may increase from thirteen per cent. to sixteen per cent. There is even greater increase in the fluid element.

Now, it is a question if plethora alone may produce hypertrophy of the heart. Balfour scouts the idea, and declares outright that there is in fact no physiology that teaches us that excessive nutrition promotes cardiac hypertrophy. There is no hypertrophy of the heart among the Strassburg geese, stuffed to repletion to supply the market with *foie gras*. Nor did any one ever hear, he says, of a young porker fattened for the butcher having enlargement of the heart. There must be some peripheral obstruction to start the hypertrophy. Sommerbrodt will not even admit the hypertrophy of work. He says there must be more to account for it, and appeals to the loss of the depressor reflex that makes the heart lose control of its capillaries.

As age advances the tendency to inactivity of the body increases. At the same time the appetite instead of being impaired is improved. The tissues actually demand more food to supply the waste of age. Frequently food is taken in excess, and accumulations in the blood are favored by a more prolonged rest after meals. The increase in the quantity of blood is indicated in the fulness of the vessels, in the flushing of the face, headache, in the tension of the pulse, increased impact of the heart, short breath, attacks of palpitation, and dyspnœa. When with the increase in the quantity of food, whether absolute or relative to the wants of the body, large quantities of liquid are likewise ingested, the plethora is all the more quickly developed. Individuals who have worked hard and have probably led abstemious lives, with the acquisition of a fortune easily drift into

habits of luxury. The food is richer and more abundant, and is ingested with libations of wine. These individuals begin to gain weight, become fat and florid, and soon find that every effort is attended with palpitation and dyspnoea. The distress on the part of the heart is announced at first by occasional attacks of palpitation, as after dining out or at some public banquet. The sleep is disturbed by nightmare. There is a sense of fulness about the head, vertigo in stooping over, as to button the shoe, or in any act of straining, as at stool. The individual is said to become puffy and paunchy, and by this time the hypertrophied heart is beginning to flag in its efforts to force the blood through the distended vessels. So frequently is this condition observed in the upper classes as to be distinguished as the plethora of luxury, or what the German writers call "*luxus consumption*." The child of luxury soon becomes familiar with the fact that life has its compensations in every direction, and the rich merchant, public official with a sinecure, and successful professional man learns that dignity may be secured without ease, and that *non in otio quies*.

Alcohol in any form acts in various ways in the development of hypertrophy of the heart; first, as a chemical poison in the production of arterio-sclerosis, chiefly in the stronger forms, as in brandy, whiskey, etc.; second, by increasing the quantity of blood in a mechanical way, chiefly in the weaker forms, as in wine, and more especially in beer. Alcohol acts also upon the nervous mechanism of the heart. Bollinger called especial attention to the great frequency of heart-disease in Munich, with the statement that it ranks in that city as third among the causes of death. Sendtner had already observed that the mortality from heart-disease of brewers and workers with beer was much greater than the general mortality. The blood-pressure and pulse-frequency are directly increased after the ingestion of any kind of fluid, but they are highest after beer, probably on account of its carbonic acid gas and alcohol, and possibly from the preponderance of potash salts. Next in descending series after beer are brandy, wine, coffee, tea, cocoa, water. Bollinger observed that after the ingestion of a pint of water during work by a strong girl, aged twenty-two, the blood-pressure returned to the normal in the course of one hour, but after the ingestion of a pint of wine and water or of a pint of beer, under the same work, the blood-pressure reached the normal only after two hours. The bloated beer-drinkers of our own country nearly all suffer in the course of a few years from dilatation of the heart, the consequence of previous hypertrophy. Billings showed that the mortality of dealers in liquor from twenty-five to sixty years of age from diseases of the circulatory system was one hundred and forty, while that of men generally was one hundred and twenty to the thousand. My experience with brewers leads me to believe there is a much greater disproportion. Where luxurious habits, especially the ingestion of alcohol, are associated with disease,—for instance with syphilis, which is the real progenitor of arterio-sclerosis,—or where the heart is kept in a state of excitation by nerve-irritants, strong

coffee, tea, and tobacco, the effect upon the heart is even more rapid and certain. The hypertrophy of the heart which occurs in age directly introduces the subject of arterio-sclerosis.

Charcot commented upon the fact that, while every other organ in the body shrinks in volume in advancing years, the heart preserves its natural size, and in some cases undergoes a real hypertrophy. Cohnheim also noticed the fact that the heart of an old person does not, as a rule, participate in the general atrophy of the body, especially of the muscles, but rather increases in mass and volume. Beneke believed that only those individuals reach advanced life who are naturally endowed with strong hearts, and that age is not a possible inheritance of all, but only a select few destined to it from birth; but Balfour cites this view only to refute it with the declaration that he has seen too many weak hearts, and even hearts mechanically defective, attain advanced age to be able to regard the idea as even approximately true.

Arterio-sclerosis is the most pronounced factor in the process of senile involution. The so-called natural death occurs by the process of arterio-sclerosis.

Without knowing the steps of this process, Bichat, with the prescience of genius, said, as long ago as 1805, the great difference in death from old age and death from sudden seizure is that "death in age commences at the periphery and ends at the heart,—the empire of death begins at the circumference and ends at the centre; while in sudden seizure death commences at the heart and spreads over the body generally,—death begins at the centre of vitality and gradually extends to its utmost bounds."

Anything which favors the development of arterio-sclerosis precipitates the changes of age. These causes are chiefly alcoholism, syphilis, Bright's disease, diabetes, gout, saturnism, and psychical influences.

Syphilis may enlarge the heart by the direct deposit of gummatous tumors, but more frequently in the processes of arterio-sclerosis. Syphilis ranks next to alcohol in the production of cicatricial myocarditis. This condition soon renders the heart incompetent, and sudden heart-failures, marked by palpitation, dyspnœa, more rarely by cyanosis, oftener by præcordial pain, may immediately precede sudden heart-failure and death. In some of these cases death occurs really suddenly without any previous sign of infection of the heart. More frequently the process is slower, and the first indication of infection is an early exhaustion. In these cases there is usually more or less dyspnœa upon exercise, and œdema may show itself about the feet at night. Syphilis of the heart belongs among the later manifestations of the disease. It may, therefore, show itself in the absence—that is, after the subsidence—of other lesions. But the history of the infection can usually be traced under a searching examination. Thus, sometimes osteophytes are felt upon the legs, or faint cicatrices or pigmentations about the tibia stamp the character of the disease. Sometimes there is evidence of alopecia. Patients complain of pain, sometimes fixed and deep-

seated, in the bones, especially in the bones of the skull, tibia, and ribs. I would not dare to dwell here upon the signs of syphilis. Dilatation of the heart soon supervenes when syphilis attacks the heart, and the cause of the condition is readily revealed so soon as it is suspected; then any doubt is soon dispelled by the efficacy or failure of treatment. One of the most satisfactory cases which I ever had was that of a fashionable lady at a watering-place, who suffered attacks of vertigo and dyspnœa, at first only upon exercise, as in the ball-room, later upon lighter provocation, as after the ingestion of strong coffee or emotional disturbance, and who showed distinctive evidence of dilatation of the heart in a weak and irregular pulse, in œdema of the feet, in association with a few vague physical signs on the part of the heart itself. This patient had wandered wide in the vain search of relief. The case had been properly diagnosticated as a myocarditis by many good men, and digitalis and other heart-stimulants had been regularly administered, but always without any real avail. The request for a remedy for falling of the hair first excited my suspicion of a possible syphilis, and then a slight examination of the history in the right direction soon disclosed the previous existence, many years before, of an eruption, sore throat, ulcers of the tibia, one of which, in fact, existed at the time, with other unmistakable signs of the disease. Under the inunction treatment this patient made a rapid recovery.

The relation of Bright's disease to hypertrophy of the heart is too broad for discussion in the limits of this paper. Besides, the connection is so well known that the feel of a hard pulse in the radial artery refers the practitioner at once, in the absence of valve lesion, to disease of the kidney.

Diabetes produces enlargement of the heart through arterio-sclerosis. Israel found hypertrophy of the left ventricle in ten per cent. of the cases of diabetes, Meyer and Saundby in thirteen per cent. The hypertrophy of the heart was found in connection also with disease of the kidney. Meyer found hypertrophy of the whole heart in twenty-four of ninety cases of diabetes (twenty-seven per cent.) during life.

Gout always affects the heart in time. The older writers never fail to speak of gout of the heart. The heart is affected generally in connection with the kidneys. The hypertrophy of the heart is usually considered a sequel of the cirrhosis of the kidney. The modern view is rather to the effect that the same cause produces both conditions. At least the pathological process in both organs is an expression of interstitial sclerosis. Atheroma of the coronary arteries is very frequent in gout. All the conditions are favored by the fact that they occur in age, which is in itself an important element in the production of arterio-sclerosis.

The influence of saturnism in the production of hypertrophy of the heart is so generally acknowledged as to make it superfluous to cite authors or statistics. In fact, the influence of lead-poisoning throws a strong light upon the chemical character of the toxæmia in alcohol, syphilis, and gout. Saturnism is more frequent than is commonly believed. Sometimes it takes

a cross-examination to disclose it. I was called last month in consultation with a physician and surgeon to give a casting vote as to the necessity or not of opening the abdomen in a case of apparent obstruction of the intestine of five days' duration. The case impressed me as an intestinal paresis. There had been a history of continual constipation and with it some colic, but there was no other sign of lead-poisoning, and there was no lead-line on the gums. I succeeded in discovering the fact that the patient, the foreman of a large establishment, had improvised an ice-cooler with lead-pipe, by coiling it round and round like a coil of rope and filling the centre of the coil with ice. After this discovery the bowels were moved with a good big dose of laxol.

HYPERTROPHY FROM MYOCARDITIS.

Hypertrophy occurs in the same way in the various degenerations of myocarditis, and enlargement of the heart is usually seen in the course of diphtheria, scarlet and typhoid fevers, which are the most frequent causes of myocarditis. Penzoldt speaks of the acute dilatations which occur in this group and which belong in a characteristic and tragic way to diphtheria. Acute dilatations have been observed also in typhus fever, pneumonia, erysipelas, and dysentery. As the heart muscle is rapidly weakened in these affections, the enlargement is chiefly the result of dilatation, but for a time the heart counteracts the weakness of its structure by increase in its volume. Krehl finds from his studies that, as might have been premised, inflamed muscles contract badly. Under defective contraction the ventricle does not empty itself entirely. There is of necessity, as Roy and Adami call it, residual blood in the ventricular chambers. These acute observers found, in fact, in their experiments on the lower animals, that "when they pushed the little finger into the cavity of the ventricle it could be felt that, while the walls of the ventricle in the lower two-thirds up to the apices of the papillary muscles close completely around the finger, there is a clear space in the upper third which is not and cannot be emptied of blood." These observers show, therefore, that hypertrophy is never primary, but is always preceded by dilatation. They thus give the death-blow to concentric hypertrophy. Hypertrophy is always, of necessity, eccentric. It is difficult to keep from straying into the inviting fields of physiology and pathology. I may make the remark that chronic myocarditis is a hypertrophy of the heart.

We return at once to hypertrophies in consequence of nervous influences. Here may be studied first the hypertrophy from mechanical irritation of the vagus, from irritation in the course of the origin of the trunk of the vagus, as from sclerotic changes in the medulla in the course of bulbar affections or irritations of the trunk of the nerve by the pressure of tumors, lymphatic glands, etc., which lead eventually to hypertrophy of the heart. Whatever may be the theory of its origin, Basedow's disease is attended sooner or later by enlargement of the heart. The change in the outlines is

not apparent at first, but ensues after the development of the goitre and exophthalmus and the existence of palpitation for some time. It is noticed then that the heart is enlarged; the dulness reaches to and beyond the right border of the sternum, while the apex is dislocated downward and to the left. The enlargement here, however, is not so much a hypertrophy as a dilatation, which soon sets in, as is evidenced by the paroxysmal attacks of dyspnoea, and more especially of extreme frequency of the pulse, tachycardia, which is when extreme—two hundred and more—now regarded as a sign of acute dilatation. Most cases of Basedow's disease succumb sooner or later to heart failure.

HYPERTROPHY FROM CHEMICAL IRRITATION OF THE VAGUS.

Under this head may be considered the action of alcohol, which has already been studied in connection with the changes in the vascular system and increase of muscular effort, and of tobacco, coffee, tea, and stimulants of this class. Tobacco affects different people in different ways. Most people are poisoned by it at the start. Ordinarily, tolerance is begotten in time and the individual may indulge in the use of tobacco, even to excess, without any symptoms of distress other than occasional nausea. Certain individuals may use tobacco to excess without any perceptible effect upon any organs of the body, but, as a rule, excess is punished in the long run. It is a common experience that an individual may use tobacco throughout the whole period of adolescence and maturity with perfect impunity; then at the age of forty to fifty, all at once may ensue some of the toxic effects of the drug; but if he pass this period without suffering, he may be able to smoke without fear the rest of his days. Certain of these effects which are characteristic are affections of the nervous system of the heart. Tobacco acts in some persons upon the motor and in others upon the sensory apparatus of the heart. Certain individuals are affected with neuralgia of the heart, sometimes so extreme as to simulate a genuine angina pectoris. In other cases only the motor apparatus is affected, and the heart is thrown into palpitation or shows arrhythmia or tachycardia. The tobacco neuroses of the heart occur more especially after smoking strong cigars in great number, often after the use of one cigar after another during the whole course of the day. These individuals may then be seized all at once during the night with a neuralgia of the heart or with a severe attack of palpitation. Attacks after chewing tobacco are less frequent, but one such case occurred in the practice of the writer, and the attack, which was the culmination of a series of prodromata, showed itself with such severity when it occurred as to cause the patient to abandon his filthy habit at once and forever. It is said that though other symptoms of tobacco-poisoning may ensue, these attacks of neuralgia and palpitation of the heart never occur after the use of cigarettes.

Coffee is a direct stimulant of the heart. The active principle of it, caffeine, exercises its chief influence on the nerves of the heart. The use

of strong coffee invariably brings on an attack of palpitation in some people, and the excessive use of coffee leads finally to exhaustion and enlargement of the heart. Tea acts in the same way, though it is a milder beverage, and is therefore oftener indulged to excess. Palpitation of the heart belongs among the common symptoms of tea-drinkers' dyspepsia.

HYPERTROPHY IN CONSEQUENCE OF EXCESS IN VENERY.

Excess in venery exhausts the heart both by physical effort and nervous strain. Such excess is most frequently indulged in by young men, and attacks of palpitation and exhaustion, associated in course of time with hypertrophy of the heart, are occasionally observed. These conditions are sometimes seen in young married life, but are more frequent when unnatural stimulus is sought in illegal relations. But the condition is not common. The heart has wonderful reserve force, and recuperates generally under rest. The physician is consulted most frequently perhaps by older men, especially by older men with young wives, or by the habitual *roué* and *débauché*. But coitus reservatus and coitus prolongatus hurt the heart. Women are almost never affected in this way, though the condition has been reported in exceptional cases, especially among prostitutes and sexual perverts. Children or young people of either sex who indulge in masturbation to excess may suffer in the same way. I have seen much more palpitation and præcordial anxiety from this cause and because of the depressing psychological effects.

The vagus nerve slows the heart and may reduce the output as much as thirty per cent. Such a reduction as that leaves blood in the heart. The nervous mechanism of the heart is adjusted with infinite nicety. The heart is made for the body. The capillaries are formed first in the tissues, then come the smaller vessels, next the larger vessels, finally the heart, of the proper size, weight, and capacity, in every way in proper proportion to the wants of the tissues. The tissues signify their wants to the heart.

The heart also has a way of signifying its capacities. It can, through the arterioles, control the calibre of the capillaries, but if these vessels are sclerotic they cannot respond to the heart, consequently so far from assisting in the circulation of the blood by their own resilience they throw extra work upon the heart by resistance. Further, stimulating and inhibitory influences go to the heart from all parts of the nervous system. It is true that there is no tonic like pleasure. In the same way the heart feels the influence of depressing emotions. Balfour speaks of the pathetic manner in which life is every day shortened by the petty troubles, anxieties, and worries which are of daily occurrence, and which by continual inhibition impair the ventricular systole and favor dilatation of the heart. "There are few of us," he says, "who have been in practice for even but a short time who have not had occasion to note the development of serious cardiac symptoms from the trouble arising out of untoward domestic affairs, the worry of an unsuccessful business, or even the wear and tear of a too suc-

cessful business which has outgrown the physical powers of its manager." Leyden distinguishes two stages of this affection of the heart, which is produced *non vi, sed sæpe cadendo*, the stage of erethism and that of organic dilatation.

I have in this simple clinical study laid myself liable to the charge of having confounded hypertrophy and myocarditis. And I have not drawn lines between these conditions. The anatomist does not, and why should the clinician? This leads me to the last word about hypertrophy.

From whatever cause it may occur, hypertrophy of the heart is differently interpreted by the pathologists. Hypertrophy has long been regarded as a physiological process, as an overgrowth which overcomes obstacles. It is always spoken of as a compensatory process, and is regarded with favor by the clinician, who considers the outlook good so long as the hypertrophy is marked, and makes his prognosis bad only when the hypertrophy begins to give way, when the heart muscle suffers degeneration and the heart chambers become dilated. It is certain that it may last for years. Thus, Balfour speaks of an acquaintance with a hale old gentleman, eighty-six years of age, who for sixty-six of these years was known to have suffered with a dilated and hypertrophied heart. Sixty-six years, he said, is certainly the longest period in his experience that mitral regurgitation with hypertrophy has been known or even surmised to exist. We cite for the comfort it gives to patients the statement of Sir Andrew Clark, who knew of six hundred and eighty-four cases of chronic valve-disease, which showed no symptoms of heart-disease for five years. Bean calls this hypertrophy providential; all clinicians call it compensatory.

But this view does not remain undisputed at the present time, at least it does not apply to the peripheral hypertrophies. Thus, certain pathologists of the modern school are not willing to consider hypertrophy as at all a physiological process. It is regarded always as evidence of disease. Krehl, for instance, claims it as certain that hypertrophy of the heart "carries with it in its formation the germ of death, and this fact distinguishes it absolutely from the physiological hypertrophy of the skeletal muscles." Nobody, he says, considers the strong biceps of a gymnast as dangerous, "but what experienced physician would venture to consider an hypertrophied heart healthy, no matter how well it does its work at the time? The great mass of men who have this hypertrophy succumb to insufficiency." Further, he maintains that an author may cite a number of cases of improvement under proper treatment, but none in which the heart symptoms entirely disappear. Krehl always finds anatomical evidence of disease, usually in some of the processes of arterio-sclerosis in the hypertrophied muscles of the heart.

Van Noorden distinguishes the hypertrophy of the heart in diabetes as a welcome complication; for of itself alone it is never the cause of any distressing symptoms. But he recognizes at the same time that the muscular tissue of this hypertrophy shows a greater tendency to subsequent

exhaustion and weakness than does the tissue of the normal heart. Frerichs has shown that heart-failure, entirely independent of coma, is a not infrequent cause of death in diabetes. The final fatal failure follows immediately some unusual exertion or emotion.

So it is certain that a more thorough appreciation of the causes which lead up to hypertrophy of the heart would enable us to recognize the frequency of the condition in its slow insidious development, and by recognizing it earlier would relieve medicine from some of the opprobrium which rests upon it in connection with the frequent reports of sudden death from "heart-failure."

COLLES'S FRACTURE; WITH SOME NEW SUGGESTIONS IN THE TREATMENT.¹

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COLLES'S fracture is the name given to a transverse fracture of the radius, when it occurs from one-half inch to two and one-half inches above its articulation with the scaphoid and semilunar bones.

At about three-fourths of an inch above this articulation, the cancellous structure of the lower end of the bone, which has the thinnest possible film of compact substance, meets the compact substance of the shaft. Their very unequal density tends to localize the fracture at this place. The first description of this fracture was given by Colles, of Dublin, in 1814. Barton, in 1838, followed with a very accurate description of oblique fracture of the lower end of the radius involving the articulating surface, which fracture bears his name. Colles's fracture is the most common fracture that we meet. It occurs oftenest in middle-aged and elderly people. It is often comminuted or multiple. The shaft of the bone is often split and the styloid process sometimes broken off, or, in young people, the epiphysis may be separated from the shaft. The classic fracture is usually transverse and often impacted. It is usually caused by a fall upon the palm of the hand, but sometimes the traumatism is applied to the back of the hand. The violence is usually indirect, and we have a great diversity of deformity. The periosteum on the posterior surface of the bone is usually not torn. Opinions of eminent authors vary greatly as to the mechanism of this fracture. Believing Chelius's account of this lesion to be the best, I will submit it to you. "The displacement is a triple one; first, backward as regards the antero-posterior diameter of the forearm; second, rotation backward of the

¹ Read before the Mahoning County Medical Society, January 14, 1895.

carpal surface of the transverse diameter of the forearm; third, rotation through the arc of a circle, the centre of which is situated at the ulnar attachment of the triangular ligaments, to the tip of the styloid process of the radius. Thus, in a fall upon the hand, the force is received principally by the ball of the thumb, and passes to the carpus and to the lower end of the radius. If, at the moment of impact, the angle between the axis of the forearm and the ground is less than 60° , the line representing the direction of the force passes upward in front of the axis of the forearm. The whole shock is, therefore, borne by the lower end of the radius, which is broken off, and, the force being continued, the lower fragment is driven backward. Should the angle be greater than 60° , the line of the force passes up the arm, and the result is either a severe sprain at the wrist or a backward dislocation at the elbow. The carpal surface of the radius slopes forward, and, therefore, the posterior surface of the bone receives the greater part of the shock, hence the rotation of the lower fragment backward on the transverse diameter of the forearm. The carpal surface of the radius slopes downward and outward to the radial edge of the arm; therefore the radial edge of the bone receives the principal part of the shock through the ball of the thumb. As a result, the radial edge of the lower fragment is displaced upward to a greater extent than the ulnar edge of the fragment, which remains firmly attached to the ulna by the triangular ligament." By means of this rotary displacement the tips of the two styloid processes come to occupy the same plane, or the radial may even mount above the ulnar. In nearly every case there is some impaction caused by the difference in the structure of the two fragments; only rarely are they so separated as to ride one over the other; but if this does occur, there is an extensive laceration of the ligaments. Some authors claim that the deformity is due to muscular action caused by the contraction of the supinator longus, extensors of the thumb, radial carpal extensors, and the pronator quadratus.

Lecomte and others claim that the fracture is due to the tearing of the bone by strain upon the ligaments of the wrist, and that the deformity is retained by the triangular ligament. The lower epiphysis in the cadaver can be torn from the shaft by forced extension in young subjects. This epiphysis unites with the shaft at about the twentieth year. Its junction with the shaft is represented by a nearly horizontal line, and the epiphysis includes the facet for articulation with the ulna and the point of insertion of the supinator longus muscle. Lecomte's idea has been carried out by many prominent men,—namely, Dr. Gordon, of Belfast; Louis A. Pilcher, of Brooklyn; Duplay, Angier, Trillaux, of France, and P. S. Connor, of Cincinnati. They call it the "cross-breaking strain." All of these theories have been confirmed by experiments made upon the cadaver. It seems to me that there is very little use in trying to demonstrate the cause of a fracture on the cadaver, where the end of the bone is so completely surrounded by strong and tense tendons as is the lower end of the radius, for when the classic fracture occurs the tendons are extremely tense. Dr. F. H. Hamil-

ton's conclusions, from experiments and observations made upon the cadaver, do not wholly confirm those of the others.

Before making an actual study of this fracture on the cadaver, it was very hard for me to fully realize just why we had an abduction of the hand. Previously I had failed to be impressed with two simple, interesting, and necessary anatomical points. First, the fact that nearly the whole articulation of the wrist is between the scaphoid and the semilunar bones of the carpus and the radius of the forearm, the ulna having nothing to do with it (Figs. 1 and 2). Second, that the hand will always be in a straight line

FIG. 1.

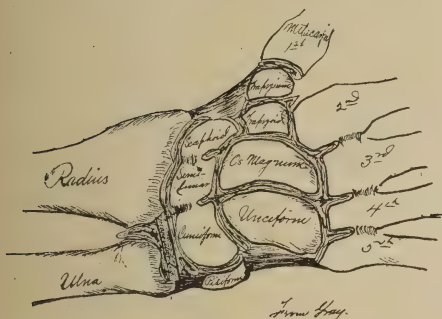
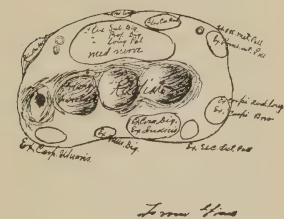
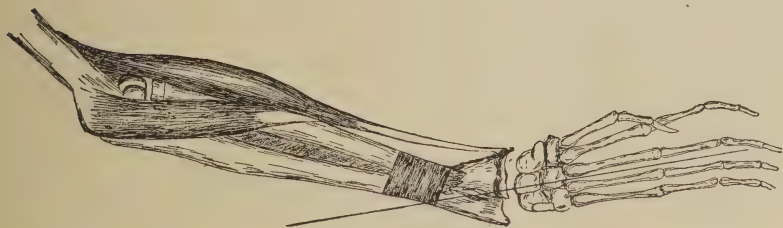


FIG. 2.



with the long axis of the lower fragment (Fig. 3). I have entirely discarded the idea of luxation of the ulna, as I was taught, except in very severe injuries of the wrist. The displacement, or rather depression, of the radius is continued by the action of the supinator longus, pronator radii teres, and

FIG. 3.



pronator quadratus muscles. Dr. E. M. Moore, of Rochester, N. Y., kindly sent me the reprint of a paper from the Transactions of the Medical Society of the State of New York, 1880, written by him, illustrating luxation of the ulna in connection with Colles's fracture. His knowledge was based upon three actual dissections of this fracture soon after death from accompanying fatal injuries, and two cases, illustrated by compound fractures, in which the head of the bone was removed by the saw, and showed very distinctly the detachment of the triangular and internal lateral ligaments from the head and styloid process of the ulna. I have here appended his elucidation of the matter. Dr. Moore says, "The force of the fall may be

just balanced by the strength of the radius ; but, in the nature of such accidents, this would not often be the case. In the majority of cases there would be some force still to be borne. Upon what structures does this force fall ? The radius, instantly on fracture, ceases to offer resistance, the hand is carried still farther back, and then the strain comes on the structures attached to the end of the ulna. It will be remembered that the ulna does not enter into the formation of the wrist-joint, but there is a distinct synovial cavity between its head and a strong membrane called the triangular fibro-cartilage. This membrane takes its origin from the rim and side of the radius, and, covering the head of the ulna, is inserted into the pit at the root of the styloid process of the ulna. As the hand, with its broken fragment of the radius, is forced backward, the strain is often sufficient to rupture the connection between the two bones or to break the ulna near the head. I have seen this double fracture only twice. The rupture takes place at the weakest point, which is at the insertion of the membrane into the pit at the root of the styloid process. But this is not the only resistance ; the styloid process is held to the carpus by the internal lateral ligament of the wrist, which takes a very firm hold upon the end and radial surface of the styloid process. This ligament also gives way, and usually does so in a peculiar manner, by pulling off the surface of the bone, which is weaker than the ligament. Thus, the remaining styloid is brought to an edge like a gouge-chisel and is shortened by about one-half. When these resisting forces are disposed of, the end of the ulna, now laid bare, is pressed against the posterior annular ligament, and is apt to become engaged upon it either by a fold or, what is more likely, by a splitting of its fibres and by a hooking up. If very great violence has been used in the production of these lesions, the head of the ulna will be driven forward through the annular ligament and skin, thus producing a compound luxation."

The diagnosis of Colles's fracture is easy, as a rule. The only conditions simulating it are Barton's fracture, which extends from the articulation,

FIG. 4.

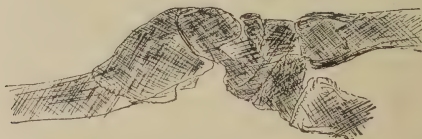


FIG. 5.



FIG. 6.

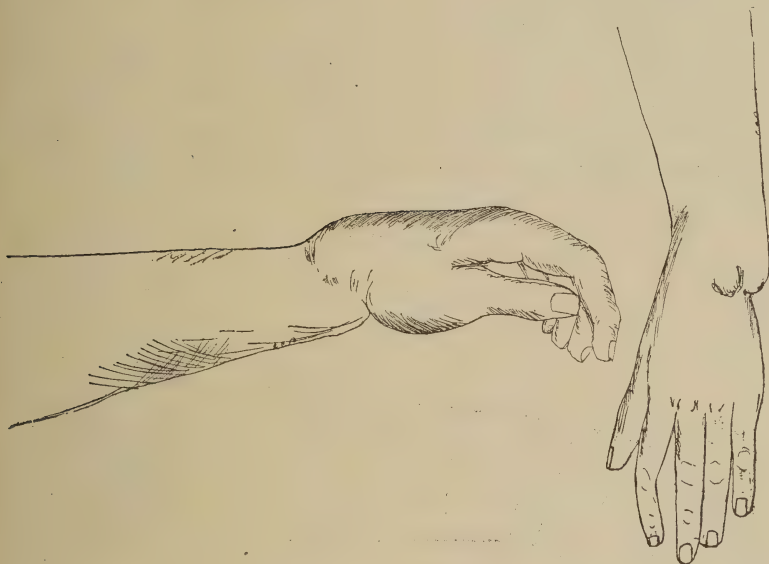


separating the posterior margin of the articulating surface (Figs. 4, 5, and 6), and dislocation backward of the carpal bones upon the radius and ulna. The characteristic deformity is quite marked, and when we remember the

anatomical lesion in Colles's fracture, the diagnosis becomes very easy. Crepitus and abnormal mobility are often absent, but the prominence on the back of the wrist, causing the "silver fork" deformity, the prominence on the palmar surface of the wrist, corresponding to the lower end of the upper fragment, and the ascent of the styloid process to a higher level, will usually make the conditions plain (Figs. 7 and 8).

FIG. 7.

FIG. 8.



The prognosis should always be guarded, for sometimes it is impossible to make a perfect reduction of the fragments. However, when reduction can be made, we can say to our patient that he may expect a useful hand and wrist, but that it is sometimes impossible to obtain a satisfactory result. The prognosis depends upon the reduction of the deformity, to a greater extent than upon any other factor. The fragments are well supplied with blood, and it is seldom, if ever, that they fail to unite. If the fracture is well reduced, ordinary judgment, with simple apparatus in treatment, is all that is necessary to bring about good results.

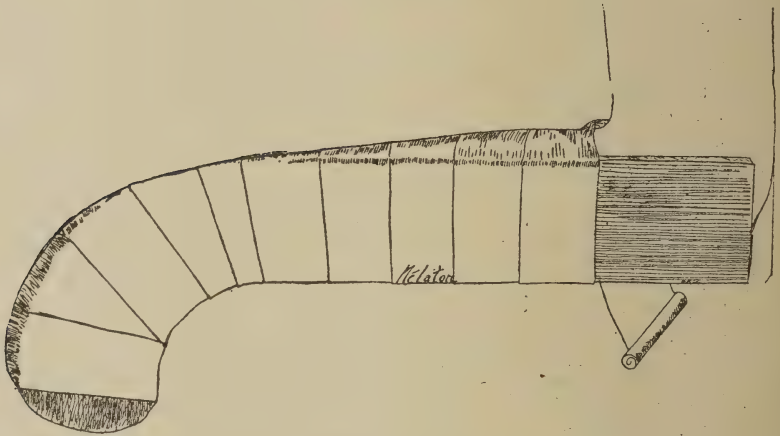
The treatment of this fracture has been largely discussed, and many eminent men have disagreed greatly as to the best means to adopt in treating it; but now I believe that all agree that the proper thing is the reduction of the deformity, followed by any simple form of splint that will hold the fragments in position until union takes place.

Reduction of the deformity is best accomplished by forced backward extension of the wrist towards the radius, and at the same time firmly grasping and manipulating the ends of the two fragments forward and backward in such a manner that they become engaged with each other and are in the normal line. This manipulation relaxes the dorsal strip of periosteum, and allows complete replacement in a moment's time with very slight pain. I

have had occasion to use this method several times, and was surprised to see how completely the reduction was made. However, we sometimes have great difficulty, especially in compound fractures, and we are then obliged to use great extending force under ether, and are sometimes compelled to excise the end of the ulna. Reduction can usually be done without ether, but I would always advise using it if any difficulty is met with, for on the reduction the result largely depends. The two fragments must be brought into line and engaged. The more careful the adjustment the less inflammation you will have to complicate the case.

A great variety of splints have been devised for the subsequent treatment of this fracture. They are nearly all long anterior and short posterior splints, with some sort of a fitting on the anterior splint for the palm of the hand. Among the numerous splints devised, Nélaton's pistol-shaped splint

FIG. 9.



(Fig. 9) was used for many years. Swinburne's straight posterior splint (Fig. 10) is, I believe, one of the best of the earlier splints, for it certainly

FIG. 10.



retains the fragments in a position to allow constant observation. Sir Astley Cooper's splint (Fig. 11) consists of an external and an internal piece, between which the hand is allowed to drop over a bandage at the wrist, thus giving some extension. Stephen Smith recommends a slightly pistol-shaped splint (Fig. 12), and by an ingenious arrangement of adhesive plaster allows

the hand to fall between the ends of the splint. It is a reliable dressing. X. C. Scott, of Cleveland, has a method of extension for the treatment of

FIG. 11.

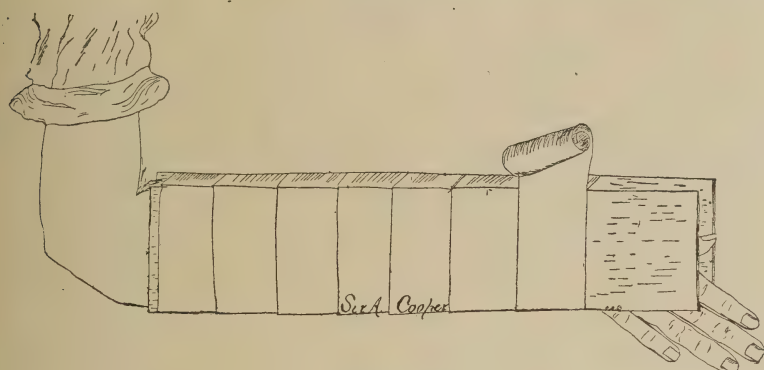


FIG. 12.

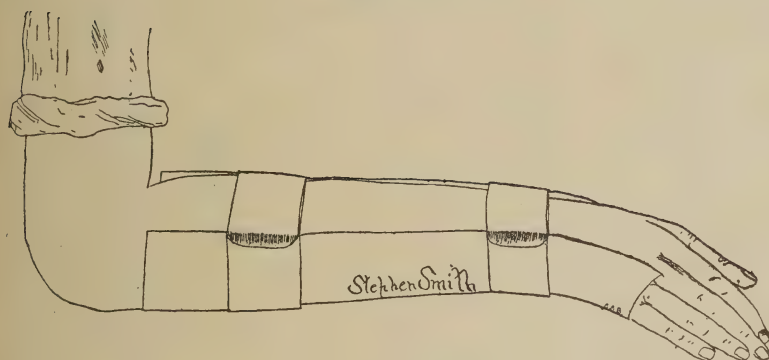
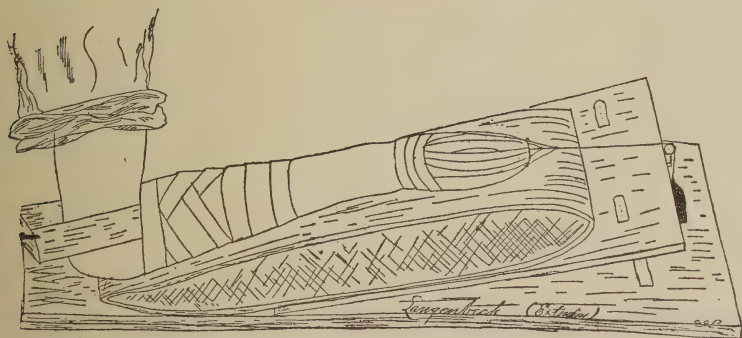
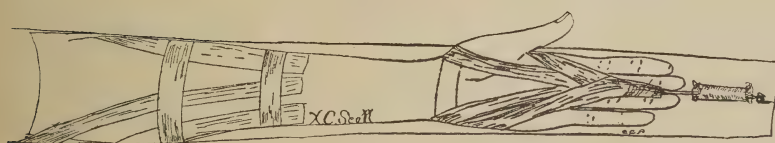


FIG. 13.



this fracture, which I have seen used with good results. It is very reliable, the only objection to it being the length of the apparatus (Fig. 13). Kerns,

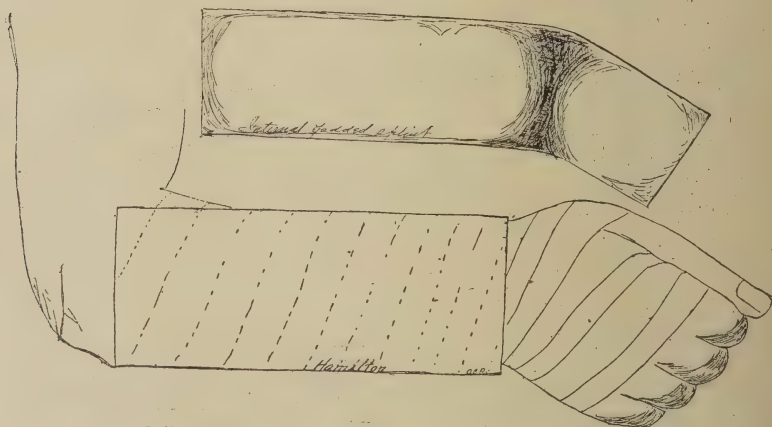
of Pittsburg, makes use of a combined curved splint which gives considerable abduction to the hand. It is a good splint, but it confines the whole hand (Fig. 14). Hamilton's favorite dressing is an internal padded splint, (Fig. 15). This is one of the best dressings. Oberest's carved wooden

FIG. 14.



made to fit the palm of the hand and the irregularities of the wrist about the carpal bones. He also uses an external splint reaching to the wrist only (Fig. 15). This is one of the best dressings. Oberest's carved wooden

FIG. 15.



splint, which is really a modification of Bond's, is excellent. Levis's splint and felt splints I cannot recommend, for their lack of stability; but they make a good temporary dressing, and are very handy to carry in the buggy or to use in an emergency. Hay's and Coover's splints are also good ones, but very much like Bond's. Gordon's is a good, substantial splint, I should judge, from its make up, although I have never used it. Anything in the form of a wooden or metal splint should always be a little wider at all points than the hand and the forearm. Bond's splint is more largely used than any other dressing: it is a good one and very reliable. Wyeth uses plaster of Paris (Fig. 16), which can be cut on either side if you wish to remove it often. It makes a good dressing used in this manner. I think plaster should never be applied and retained before the swelling is entirely gone, and you are ready to retain the member until firm ossification has

taken place. Helferich protests against immediate use of plaster of Paris, because it obscures the parts. Dr. Pilcher's modified dressing (Fig. 17)

FIG. 16.

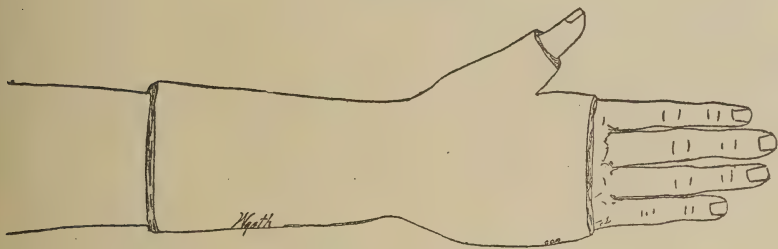
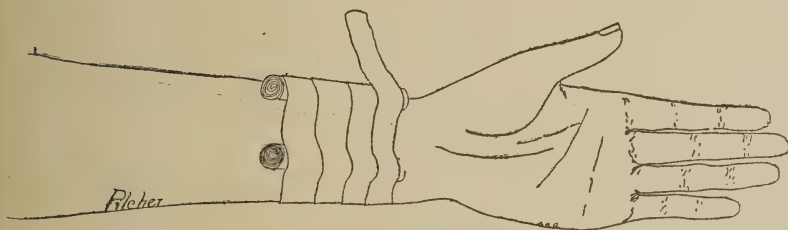


FIG. 17.



consists of two bandages, two and a half inches in width, rolled to the size of the little finger and placed, one on the inner side of the ulna, extending to the carpal bones, the other parallel to it on the outer edge of the radius, over the styloid process; while an assistant holds the fragments in place, these rolls are covered in by continuous wraps of adhesive plaster, one inch wide, from the carpus to the upper end of the rolls. This, certainly, is a very simple dressing, and is said to be a very good one. Dr. Gregory Doyle, of Syracuse, describes an anatomical splint made of plaster of Paris by means of pieces of cloth dipped in plaster cream, formed and bandaged to the normal arm of another person until dry, and then applied to the injured arm. He flexes and abducts the hand slightly. This splint ought to give good results. Dr. Petersen advises simple suspension of the arm in a sling in a position of pronation and ulno-volar flexion (Fig. 18). Dr. Bardeleben thinks this treatment is admissible only for intelligent persons. Dr. Moore's dressing consists of a roll from half to three-fourths of an inch in diameter and two inches long, carefully placed under the ulna, abutting against the pisiform bone. Now, a piece of adhesive plaster of the same width is drawn with as much force as it will bear around the wrist, over the roller, and pinned to prevent relaxation. The distal edge of the plaster is drawn around on a line with the end of the radius. This plaster grasps the broken fragments, and holds them straight and against the ulna. The hand is allowed to hang naturally in a sling which is over the roll and plaster. The weight of the hand and that of the forearm help to press the ulna up into place.

I have no new apparatus or any special kind of dressing to advocate in this paper, and am only emphasizing the preferences already given in speak-

FIG. 18.

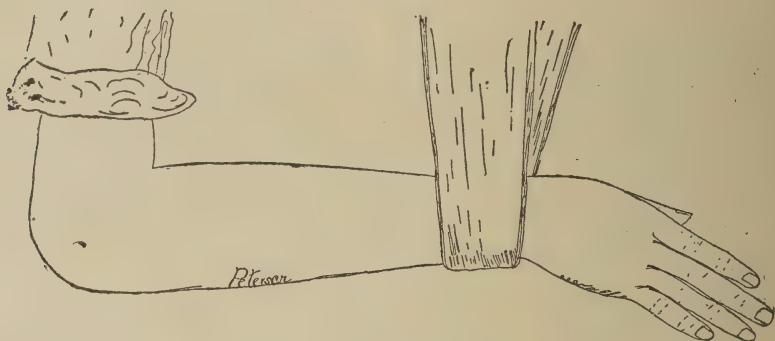


FIG. 19.

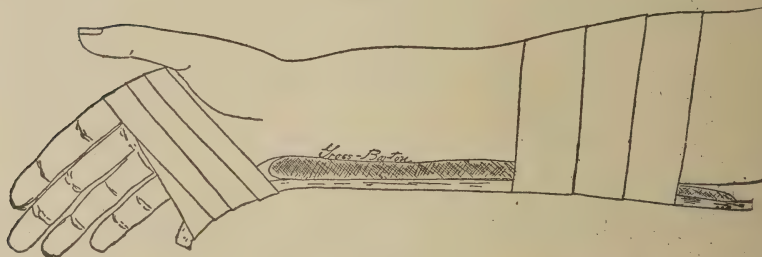


FIG. 20.



ing of the different forms of dressing ; but I do wish to advise firm massage during the first week or ten days of treatment, or until we deem it necessary to fix permanently and retain the fragments for ossification,—not only in this particular fracture, but in all fractures accompanied by so much injury to the soft parts, by so much subsequent swelling and inflammation, and by the ultimate danger of the member being partially disabled, painful, or rheumatic. By firm massage I mean firm pressure with the thumbs, well lubricated, over and around the joint which has been injured, once or twice a day, with as little disturbance as possible to the already adjusted fragments. It is perfectly wonderful what this will do for sprained and injured joints. I have used it to very great advantage. It should be applied for one-half hour at a time, with an assistant to keep the broken fragments in place if necessary. The joint also should be moved in all directions after you have given the massage. It stimulates the absorbents to remove the

inflammatory exudate from the joint, and from the tissues in the vicinity of the fracture. It favors the formation of callus, and relieves engorgement and unnecessary inflammation. In this character of injuries there is always more inflammatory action than is necessary for repair. All the books teach us to use massage and passive motion after we have obtained osseous union. By this time there is generally present plastic exudation, which quite frequently arrests the movements of the tendons in their sheaths and the movement of the articulating surfaces. This exudate can, I believe, be nearly all removed by the end of the first week or ten days of treatment by the above method.

After the first ten days we should cease removing the splints every day, and allow the dressing to remain and the fragments to be kept fixed in the proper position. The bandages should be tightened every day for several days, if necessary, by a system of lacing with strong linen thread passed from one side to the other. This will save disturbance of the fragments at a time when it is dangerous to move them. The dressings should be allowed to remain until you are satisfied that firm osseous union has taken place. This may be two or four weeks, making from three to five weeks of treatment. Now, when you come to remove the splints, you will not feel that it is the greatest effort of your life, and tremble with the fear of finding a displaced bone, because you have had ample opportunity to see that the bones were in their proper position before you put on your permanent apparatus. Your patient will have a better result by one-half than he would have had without this form of treatment. In the cases that I have treated in this manner, there was scarcely any stiffness of the fingers or of the wrist when I removed the splint. Your patient should now be instructed to avoid severe use of the member until he himself feels that the injured arm is perfectly solid and sound.

In bad results, Dr. Weir advises osteotomy, followed by extension, and I believe that he is correct. We ought not to have so many bad results in this age of aseptic surgery, when, if necessary, we can at once cut down and adjust, or wire the fragments, if they cannot be reduced. A small scar on the arm is much superior to an unreduced fracture and an almost useless wrist.

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RIGID OS.

BY JESSE HAWES, M.D.,

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IN treating the subject of rigid os, I shall not consider those cases of anomalous development of the uterus during pregnancy in which there may be a sacciform enlargement of a portion of the wall of the cervix above the uterus. It is sufficient to mention the possibility of this condition being mistaken for rigid os or for a complete occlusion of the os. I shall also throw out of consideration those cases in which a pendulous abdomen allows the fundus of the uterus to fall forward, at the same time carrying the cervix backward possibly beyond the reach of the examining finger. The cases that will receive attention will be only those arising from a non-malignant structural change in the cervix caused by the formation of cicatricial tissue and those of purely functional character.

Cicatricial tissue may exist in the cervix uteri as the result of lacerations in previous labors, as the result of mechanical injury from instruments used in producing an abortion, or as the result of irritating applications. Slow dilatation of the cervix may be due to adhesions between the foetal membranes and the lower portion of the uterus, or it may exist independently of any diseased condition. The latter statement will be more readily appreciated when we remember how many women have had laceration of the cervix in previous labors without producing stenosis in succeeding labors; when we remember what a large number of multiparous women have had endocervicitis without puerperal orificial stenosis; when we remember that dilatation of the cervix and parturient canal in the primipara is almost always slower than in the multipara, though the majority of these women have never had any injury to the cervix.

The field for our discussion has now been narrowed down to rigid os, dependent upon or independent of organic change.

The differential diagnosis between the two conditions is theoretically quite easy; practically it is quite difficult. In those cases dependent upon

organic change, we may find evidences of previous mechanical injury, or we may obtain a history of endocervicitis. In such cases we may expect much from the mechanical power of the vertical fibres of the uterus. Indeed, we must depend almost wholly upon mechanical force for dilatation of the os in these cases, and the power of the vertical fibres being insufficient, recourse must be had to mechanical assistance by the accoucheur.

Having decided that dilatation of the os is progressing too slowly or not at all, we must consider the remedies that may be used to hasten the dilatation. The remedies that have won the respect of the profession in the past are: chloral (1), wine of antimony (2), opium (3), calomel (4), chloroform (5), and quinine (6). Chloral, in my estimation, stands first on the list. From forty to sixty grains may be given in three hours, by mouth or by the rectum. Chloral allays excessive irritability, permits the patient to sleep or rest between the pains, slightly lessens the erethism of the pelvic organs, and, lulling these to quietude, facilitates the physiological process. Usually, this drug does not interfere with the force or regularity of the true labor-pains, though sometimes it does. The contra-indication to the use of chloral is marked cardiac weakness. In cases thus complicated, its administration should be preceded by a cardiac stimulant tonic. Second stands wine of antimony. This will often relax the teased, irritated, and resisting circular muscle fibres, without diminishing the force of the normal contractions. Compared with chloral it is less soothing to the system, but, at the same time, it is less liable to retard labor. Wine of antimony nauseates, and is objectionable when nausea already exists. Its value does not seem to depend upon its nauseant action, since other nauseants are of little value. Chloroform is often of much value, but, when once its administration is begun, it is difficult to obtain consent to its withdrawal. Before administering chloroform, therefore, I always state to the patient that I shall not continue its use beyond the short time required to observe its influence upon rigidity. This remark paves the way for me to discontinue its use whenever I desire, with less protest upon the part of the patient. I have no fear of its depressant action upon the heart of the parturient. Opium and its combinations are of value. They are of value to the patient exhausted by long-continued fruitless pain. They are of value to the strong woman lashed into desperation by constant, nagging, merciless pains, augmented by the cutting, agonizing, torturing throes depending upon a rheumatic or neuralgic uterus. But opium, in the great majority of cases, will retard labor, and, if an early termination of labor is essential, this property should be considered a contra-indication to its use. Calomel is quite allied to tartar emetic. Quinine is indicated when a stimulant is needed; when the pains are flagging from exhaustion of the patient. There is another remedy—belladonna—mentioned by some French writers. They advise its use by the mouth, by injection into the cervix, or by hypodermic injection of its alkaloid.

Two or three times, quite recently, I have read little paragraphs in

medical journals speaking with the utmost positiveness of the power of atropine to dilate the cervix, when given by injection into the cervical tissues. I have several times applied belladonna ointment to the cervix and have given belladonna by the mouth without beneficial results, but this positiveness led me to distrust my own experience, and made me almost anxious for an opportunity to demonstrate the promised power of the drug. A few weeks ago I had what I regarded as a typical case for its employment,—a case of functional stenosis of the cervix. I introduced a Nott's speculum into the vagina of my patient, wiped away all mucus and blood, pushed the point of the hypodermic needle into the cervix for about one-fourth of an inch, and deposited in the cervical tissues about one-one-hundred-and-twentieth of a grain of sulphate of atropine. I waited an hour, and finding no perceptible dilatation or softening, I injected one-ninetieth of a grain of sulphate of atropine into the parenchyma of the cervix. A little piece of cotton wrapped on the end of a pencil was immediately pressed against the point of puncture to prevent any escape of the solution. At this time the patient said that her throat was quite dry. At the end of an hour the throat was very dry, the face showed well-marked atropine efflorescence, but the cervix was still hard, and two hours afterwards I found it in almost the same condition.

What can be done for the patient by local treatment? Warm vaginal injections may do good and may do harm, by washing away mucus and drying the muciparous glands. Hot sitz-baths are less objectionable. Moist or dry applications to the vulva have some value, but my preference in this line is for a warm rectal injection. At the same time, mechanical dilatation of the cervix may be made. I don't like Barnes's dilators. They are hard to insert and to retain in place. They may burst and drive water between the membranes and placenta and the uterus. You cannot tell whether they tear the womb or not while they dilate. I have a pair of placental forceps whose whole length is twelve inches. They are bent three inches from the distal extremity to form an angle of about forty-five degrees. The distal end of each blade is three-fourths of an inch broad, smooth, flattened, and with round edges. While the patient is in a bath-tub of antiseptic water or while lying in bed, with a quart of warm water in the large intestine, I can, after dilating the os with my finger, introduce the placental forceps into the cervical canal. The bend of the forceps corresponds to the angle formed by the uterus with the vagina. With my right thumb and finger at the proximal end of the forceps I can exert all the pressure that can safely be made, while my left forefinger, passed along by the side of the forceps, can quite accurately measure the tension that is being exerted upon the cervical tissue. I have easily felt the slightest sensation of tearing or snapping of muscular fibres beneath my fingers or transmitted through the metal, and, warned in time, have desisted from that method of dilatation at once. I regard my forceps, carefully used and carefully watched, as the safest method of mechanical dilatation until the cervix will admit my index,

middle, and ring fingers. When further mechanical dilatation is deemed necessary, I place the patient under the influence of chloroform, render the vulva, vagina, and my hand and wrist aseptic, lubricate my hand with aseptic, non-medicated cosmoline, and pass the whole hand through the introitus vaginae. The fingers, one after the other, can be introduced into the os; then, by closing them into the palm, the mechanical power can be accurately applied and carefully measured. When dilatation has progressed further, the thumb can be carried into the os parallel with the fingers. The greatest circumference of my hand is much less than that of the head that must pass through the vagina, and the circumference of my wrist is not more than one-half of that. When the whole hand is introduced and firmly closed, the os can be dilated to a circumference of ten to twelve inches. In my judgment, the hand is the safest mechanical instrument we can use. It will detect the first sign of laceration; it will never cause the dangerous pressure of a metallic instrument, and it can accurately recognize the presenting part, so that forceps may be properly applied.

In conclusion, I would say, resort to mechanical dilatation only when other means fail.

OBSERVATION OF A CASE OF ARTHRITIS DEFORMANS.

BY A. L. BENEDICT, A.M., M.D.,

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A. B., aged fifty-eight years, single, native-born. The only points of significance in the family history are that both parents had rheumatism, and that an aunt had a disease similar to that of the patient herself. The patient was born on a farm and her early life was a hard one. At the age of thirty she went to Michigan, where she contracted tertian intermittent fever. With this exception she enjoyed better health than usual during the first year of her Western life.

The joint symptoms, or rather the first symptoms that seem to have a direct bearing on her arthritic disease, began at about the end of her first year in Michigan, and they suggest a connection with the malarial fever. About nine in the evening a pain would commence in the insertion of the right deltoid and in the middle of the right biceps, and this pain would last usually till daybreak. Even now, if the arm is held in one position for any length of time, the same pain is felt. Some time after the appearance of the pain in the right shoulder and arm, the index-finger became fixed in a state of flexion, and the three other fingers followed. Within a year from the commencement of the trouble, the condition had reached almost its present degree of deformity, which is as follows: The first phalanx of the index is dislocated forward and dorsally, while the finger as a whole is dislocated towards the ulnar border of the hand, and flexed over the other fingers. The remaining fingers are drawn slightly towards the ulnar border of the hand, and are dislocated somewhat as the index is, but not to as great a degree; they are, however, more fixed. On the outer condyle of the fifth metacarpal bone is a bony nodule, and there is a similar one at the base of the first. The condyles are unusually prominent, being separated

by a distinct groove from the bases of the proximal phalanges. The first intraphalangeal joint of the ring and the middle finger has a play of about sixty degrees, its utmost flexion being a right angle, and it is impossible to flex the corresponding joints much more than this. The movement of the distal interphalangeal joint of the same fingers is slightly limited. The movements of the corresponding joints of the index and the little finger are not much limited, except by their relation to the other fingers. The proximal interphalangeal joints of the second and the little finger are so flexed and subluxated as to leave a very distinct dorsal groove. There is a moderate lessening of sensibility over the entire right hand, due doubtless to the lack of proper use.

Three or four years after the beginning of the pain in the deltoid, the elbow became flexed at a right angle, and about this time the pain ceased. It is an interesting question whether the increasing disability of the limb indirectly caused the pain to cease by removing the opportunity of making such motions as would irritate the nerves, or whether the relief of pain and the extension of ankylosis (false) indicated an atrophic process involving sensory and trophic nerves alike, or whether there was simply a coincidence. It seems altogether likely that the deltoid trouble was not primarily malarial, but that the malarial poison determined the periodicity, according to the old saying that with any other disease "malaria will jump on and ride." The elbow is now movable to the extent of about forty-five degrees, but there is marked crepitus with this motion as well as with attempts at pronation and supination.

At the time the pain in the deltoid and the biceps existed, there was considerable swelling of the feet, and the patient was compelled to use crutches for about three years. The second toe of the right foot is now bent somewhat as the fingers are, but this deformity she ascribes to the use of the crutch and the dragging of the foot. Not much significance can be attached to this particular deformity, as it is not in excess of what might be caused by a badly-fitting shoe. Some time after this there was trouble with the hips, so that the patient was compelled to walk in a stooping posture, resting her hands on her knees. She was not able to continue the use of a crutch, because of the discomfort of its pressure on the axilla and the hand. After walking in the bent posture for three weeks or so she gradually regained the upright position.

In 1862, some three years before the right elbow became stiffened, and after the pain in the shoulder and arm had begun, the neck became fixed, with the head thrown slightly backward and to the left. She could not look sideways at this time, except by turning the whole body. Half an hour after every meal she would have an intense pain in the back, between the shoulders, which would pass away after an hour. The patient used to say that her victuals choked her in the back, and it seems altogether likely that deglutition, which is always more or less painful when the head is put in a strained position, developed a lameness in the pharyngeal and associated muscles. About two years after the stiffness of the neck had begun, the patient made a sudden movement of the head on account of an annoying ache, and felt a sharp crack in the back of the neck, which was also heard by others in the room at some distance, and she immediately found that she could move the head to either side. The lateral motion of the head (rotation) is now limited to forty-five degrees to either side of the median position. It seems that the patient must have ruptured some fibrous band, or cracked off a calcareous nodule that interfered with the rotation of the atlas on the axis. Just where, or of what nature, the obstruction was cannot be stated or even guessed, except that we may imagine it to have been somewhere on the articular surfaces of the arch, and not in close proximity to the spinal cord, where any displaced body would have been apt to cause paralysis if not immediate death. The writer has known of two or three instances in which the snapping of a pleuritic adhesion by some extraordinary muscular effort, with violent

expansion of the chest, has been almost indubitable, and the breaking of some similar obstacle in the neck is certainly conceivable.

Two or three years ago an involvement of the left hand began, although it had ached for some time previously. The first phalanges of the index and of the thumb are now subluxated forward, the heads of the corresponding metacarpal bones being enlarged. By the growth of the condyle of the first phalanx of the middle finger the distal phalanges are inclined towards the ulnar side of the hand. The middle phalanges of the ring and the little finger are dislocated forward so that the condyles of the proximal phalanges, though not enlarged, are prominent. The motion in these two joints is limited to thirty degrees from a right angle. About a year ago the patient first noticed a nodule on the dorsum of the radius, just above the wrist-joint, and on the palmar border of the radial articular cavity. There is slight anæsthesia of the left hand, but not so marked as in the opposite hand. There is considerable pain in the proximal interphalangeal joint of the middle finger where the deflexion is taking place. The other joints of the left upper extremity are normal.

The patient had typhoid pneumonia twenty-five years ago, but she cannot assign it a definite chronological position in the history of the joint involvement. Last winter she had another attack of pneumonia, and some trouble with the hips, which she compares to that which occurred many years ago, though not of as great severity. She has had two attacks of erysipelas, and, three years ago, she was seriously ill with severe pain in the right groin. This may have been some form of inflammation about the appendix. For ten years the patient has suffered with bleeding piles, the hemorrhages occurring once a week. She complains of a peculiar, unpleasant feeling in the back of the neck, as if she wanted to throw off something that was pressing on it. At the same time there is a sort of vertigo, the eyeballs feeling large, and a glimmer of light passing back and forth before her eyes. This ocular symptom passes away if she closes her eyes for a minute. There is also a lameness and soreness extending from the third cervical to the sixth dorsal spine. This area is sensitive to pressure, particularly at the sixth dorsal spine. There is a spot painful on pressure at the right of the spine, below the twelfth rib. The heart and the lungs are normal. The bowels are regular, appetite hearty, digestion good, teeth in fair condition. She has a chronic cough with some slight expectoration, undoubtedly due to a laryngo-trachitis.

The patient died two or three years after the foregoing notes were made, without having made any particular advance or retrogression from the condition described. The lack of examination of the urine, blood, etc., as well as the failure to note treatment, is due to the fact that the patient was seen at her home, many miles from Buffalo, and that the opportunity to watch the case closely was not afforded.

Arthritis deformans may run a course of varying acuteness, though it is never an acute disease in the proper sense of the term. With the exception of the involvement of the left hand, the present case developed in three or four years, and was nearly stationary for twenty-five. There is noticed in many old persons a tendency to nodosities about the smaller joints and to friction in the larger ones. Whether the removal of the disease in the left hand was a senile process or not, it is difficult to say. Certainly no other exciting cause was apparent. A differential diagnosis must be made between this affection and the various forms of rheumatism, gout, arthropathy of tabes dorsalis, acromegaly, the deformities of contracture after paralysis, of

cicatrization, and possibly neoplastic involvement of a joint. In most cases there would be no practical necessity of considering more than one or two of these, and, in the present case, a confusion would have been difficult.

The nature of this disease is obscure. Remak and Benedict, and later Charcot, have considered it to depend on irritability of the spinal cord and the sympathetic system. The urine and the blood have shown no typical lesion. In fact, the writer has been able to gather, in regard to etiology, only that the female sex is predisposed and that there is some depressing physical state. The present patient, a sickly, overworked girl, would naturally be as much inclined towards such trouble as any one, but it is strange that the first symptoms ascribable to this disease should have appeared after what she considered the healthiest year of her life. The possibility of an hereditary tendency is suggested by the history, but the data are not sufficiently established.

Although the theory that arthritis deformans is a necrosis (using the word in a general sense) is the most plausible one yet advanced, it has seemed to the writer that the nutritional and chemical changes which occur in and about the joints in this and in several other diseases with which it is occasionally confounded, indicate some general failure of digestion and assimilation. By this, it is not meant that ordinary gastric functions are disturbed, or that intestinal indigestion or lithæmia are conspicuous, but that there is a lack of the proper elaboration of nutriment after the gross functions of digestion are completed. Whether the liver normally performs this duty, or whether the blood, which contains a glycolytic ferment, adds this to its many functions, or whether the ductless glands are useful in this way, it is impossible even to guess intelligently. There are forms of rheumatism which seem, in a way, to be separate diseases, and to deserve a new nomenclature, while, on the other hand, there is something more than the superficial similarities which the laity recognize, which serves to bind together a number of joint, kidney, and liver lesions, and to suggest a common nutritional etiology.

CHRONIC HYPERTROPHIC CIRRHOSIS OF THE STOMACH.—LYMPHADENOMA.

BY MINOR MORRIS, A.B., M.D.,

Professor of Pathology in the Central College of Physicians and Surgeons, Indianapolis, Indiana.

THE writer recently made an autopsy to determine the cause of death in a mechanic, aged fifty-three, of good habits, who had died of obscure abdominal symptoms after an illness of eighteen months.

The clinical history was very meagre; all that could be learned was that there was, probably, an attack of acute gastritis, followed by constant pain, occasional

vomiting of blood, inability to take food, and, finally, death from progressive marasmus.

The patient was well developed, emaciated, the abdomen distended, but no dropsy elsewhere. Upon incision, the abdominal cavity presented a remarkable appearance. About a gallon of clear serous exudate filled the cavity. The abdomen was the seat of recent inflammation, with extensive adhesions, in which were embedded the liver, stomach, spleen, colon, pancreas, and omentum,—which were with difficulty separated. The omentum was a small mass of shrivelled fibrous cords, the liver somewhat enlarged and firm, the spleen atrophied by adhesions, while the stomach seemed to be attached to everything.

The source of this inflammatory process was found in the stomach. This organ was of about normal dimensions, but the wall was enormously increased in thickness to five-eighths of an inch, the various coats being apparently equally affected. The mucous membrane was thrown into great folds, and one gland, standing out prominently, measured one-fourth of an inch in diameter. At three points old oval cicatrices with pigmented outlines marked the site of former ulcerations. The orifices were normally patent, the neighboring glands unaffected, and there were no deposits in the liver.

Microscopically, the process was seen to consist of a round-celled invasion of the glandular structures of the mucosa, which became obliterated by the new fibrous tissue. The invasion was best observed in the muscular coat, where the process was not so far advanced. Here the round cells could be seen swarming in between the muscular bundles, and following them were the new fibrous elements in all stages of development. There was nothing in the examination to suggest carcinoma.

Ziegler is the only writer who has practically anything to say on this disease. His description fits this case precisely. He says, "In advanced cases, the mucous membrane is increased in its entire thickness, and rises in folds and warty or polypous excrescences. The surface becomes rough and corrugated, known as polyposis ventriculi. The hyperplastic fibrous tissue may be dense (as in this case) or soft and cellular. The glands lose their epithelium and disappear. In all forms of chronic inflammation, but especially in the ulcerative, the overgrowth of fibrous tissue may extend to the submucous, muscular, and even to the serous coats. The wall of the stomach thus becomes thickened and indurated, while the muscular fibres are more or less compressed and atrophied."

The pelves of the kidneys contained some pus; amyloid changes were distinctly present. The bladder was contracted and would not have held over two ounces. These were results from an old gonorrhoea, and to what extent they were exciting causes of the gastric disease is only conjectural.

There was nothing to account for the disease except the renal lesions, which can readily be conceived to act as the perpetuating agent of the acute process set up by unknown clinical factors.

Mucous membranes are not the usual seat of these hyperplastic changes, at least to such a degree as occurred here. The spleen and the liver are the organs most frequently invaded, and, as we are at a loss to explain cirrhosis in young subjects and the permanent enlargement of the spleen in

old cases, so we have no hypothesis to explain the fibro-cellular overgrowth in this case.

LYMPHADENOMA.

This case was seen by the author, in consultation, about six weeks prior to death. The man had then been confined to the house about two months, since exposure to a storm in September, making the duration of the entire illness about four months. The first symptom noticed was an enlargement of the cervical glands anteriorly and particularly on the right side. He then had irregular fever with several slight hemorrhages from the bowels, which led his attending physician to suspect typhoid. The temperature ranged from normal to 104° F. The appetite was capricious, but what was taken into the stomach agreed with him. When I saw him, the cervical glands, anteriorly and posteriorly, were enlarged, especially the left submaxillary. The inguinal group was also slightly affected, but no other. The fever varied as before. Three weeks before death the patient began suffering from attacks of intense pain in the epigastrium, which were ascribed to glandular enlargement of a mesenteric group. The diagnosis of lymphadenoma was made, from the variations in the size of the glands, the hemorrhages, and the irregular fever. Death ensued from exhaustion of the vital forces, no complication having arisen. The great pain was found, at the autopsy, to be due, as suspected, to a rapid enlargement of the mesenteric group, involving the nerves by pressure. Further than this, the autopsy disclosed nothing abnormal, except a little increase in hepatic firmness. The spleen was normal in size and consistency. Microscopic examination of the gland tissue confirmed the diagnosis.

Usually there is greater invasion of the lymph structures than occurred here, the mediastinal and retroperitoneal glands, the spleen, and the liver being particularly enlarged.

The cervical group, according to different authors, is the first involved. Their variable size, together with irregular fever, and hemorrhages from the bowel, will make the diagnosis not difficult. The character of the fever, glandular phenomena, and duration will exclude typhoid and syphilis. This is the third authentic case in this city in recent years.

CLINICAL LECTURES.

SENSORY APHASIA.

CLINICAL LECTURE DELIVERED IN PARIS.

BY PROFESSOR DÉJERME.

WHEN, in 1861, Broca established the fact that the function of articulate speech is localized in the third frontal convolution of the left side, there was published at first a number of confirmative observations; but other cases were reported in which, although during life there had existed marked trouble with the spoken language, the convolution of Broca was found intact, and the lesions were seated back of the fissure of Rolando, in the convolution surrounding the fissure of Sylvius,—that is to say, in the customary nomenclature, in the supramarginal gyrus and the first temporal convolution.

It was after the observation of analogous facts that the English physicians, among others Ogle, Popham (1867), Bastian (1869), were led to distinguish two forms of aphasia: one with alteration of the convolution of Broca, in which the patient has more or less lost the faculty of speech, but has preserved the internal speech,—which they designated by the name of ataxic aphasia; the other, with integrity of the convolution of Broca, and in which the internal speech is lost, a form to which they gave the name of amnesic aphasia. They employed the designation of paraphasia for motor aphasia of mild type, in which the patient uses incorrectly one word in the place of another. In 1874, Wernicke opened a new path for the study of the troubles of speech, by demonstrating that ataxic aphasia is the aphasia of Broca, and by describing the sensory aphasia, a form which is accompanied by very marked alterations of speech and writing, and which is due to a lesion in the first temporal convolution. In the great majority of cases of sensory aphasia, the clinical appearance is well marked, and distinct from the cases of motor aphasia.

Observe this man of seventy-six years, a tailor formerly, who has been in my service for three years. He was at Bicêtre, in the division for the aged, when he was brought to me on the 30th of April, 1891, in a comatose condition. After some days, he began to awaken from his torpor, and one was able to determine in him the classical symptoms of sensory aphasia: total word-deafness and word-blindness, marked difficulty of speech, agraphia for all forms of writing except for his name. This man, whom I present

to you to-day, is in a much ameliorated condition, but it is easy to recognize that he is still afflicted with this form of aphasia. As you are able to see for yourselves, there exists a certain degree of word-deafness; he does not understand all the questions which I put to him in a loud voice. The word-blindness, while very much ameliorated, is still far from having disappeared, although he recognizes easily his name, his given name, and that of his daughter, and although he understands quite well certain questions which I put to him in writing, and in which I demand of him if he is a drunkard, if he has been in prison, etc. On the other hand, as soon as I ask him certain things which do not so intimately concern him, one can easily see that he does not understand them, and, like certain cases of aphasia of which Trousseau speaks, he remains sometimes a half-hour with his eyes fixed on the same column of a newspaper of which he is unable to decipher any letter whatever. Nevertheless, this man was quite well educated, he read easily and wrote often.

If the word-deafness and word-blindness are ameliorated in this patient, the disturbances of speech and of writing are the same as at first. He is not in reality aphasic, for he talks a great deal; but he speaks badly and is incomprehensible; he joins words having sense with others which signify nothing, and which he himself coins,—in other words, he is paraphasic, and with him the paraphasia assumes a special form, of which I will speak later. The condition of the writing is easy to study in him, for he has never been hemiplegic, and he employs his right arm for all the ordinary needs of life. As you perceive, when a pen is placed in his hand, he invariably writes his name, and he writes it very badly. It may be spontaneous writing, or from dictation, or from a copy, it matters not, he always traces his name. There is no hemianopsia in this case. Such are the symptoms which the sensory aphasia of Wernicke present, and it is easy to convince you, in studying this patient, that they differ from those which one observes in the cortical motor aphasia, and which we have studied together in a preceding lesson. In order to analyze them more in detail let us return now to these symptoms.

The patient afflicted with sensory aphasia does not understand what is said to him. The spoken language does not awaken in him any idea; it is a series of sounds or of noises without sense,—in other words, there is then word-deafness. Usually this word-deafness is complete; it exists for all words, except for the name of the patient, more rarely for his given name or his profession. In the word-deafness, the patient turns his head towards the side from which he hears his name pronounced. Although at first the sensory aphasia makes the impression that the person is genuinely deaf, it is not so, for it is easy to recognize that the least noise is perceived. But the spoken words have no longer any signification for him, and he finds himself in the situation in which we are placed when in the presence of a stranger who is speaking a language of which we have not the least idea.

Concerning the written language, the sensory aphasic experiences the

same difficulty as with the spoken language. He is incapable of understanding the signification of written or printed words. In reading, he recognizes only his name, and not always that. The word-deafness and the word-blindness constitute, then, two of the cardinal symptoms of sensory aphasia.

Let us consider now the disturbances of the spoken language. You have seen that in the motor aphasia of Broca the patients do not speak; that they possess scarcely a word, sometimes only an interjection or a syllable, and that it is only after the aphasia has ameliorated—which does not always take place—that they begin to have a larger vocabulary at their disposal. The sensory aphasiac speaks, on the contrary, a great deal; he is loquacious, but his speech is incoherent; he is paraphasic. The paraphasia assumes two forms, which usually coexist. In the true paraphasia, the patient pronounces the words correctly, but they do not correspond to the ideas that he wishes to express. This form rarely exists alone, but more frequently the patient coins new words at the same time, and speaks a sort of jargon which is more or less incomprehensible (jargon aphasia of the English authors).

I have observed only a single example of true paraphasia. It was in one of our *confrères*, a man very distinguished, who was smitten with sensory aphasia at an age quite advanced. When I saw him, eight months after the beginning of the trouble, the word-deafness had almost disappeared, but the patient had remained alexic, agraphic, and paraphasic. The alexia, or, if you prefer it, the word-blindness, was total and accompanied by right lateral homonymous hemianopsia. The patient was able to recognize neither a letter nor a word, not even his own name, and he is the only sensory aphasiac that I have seen who did not recognize his name. He was completely agraphic,—I will return to this symptom presently. With him the true paraphasia existed in the literal sense of the word. He spoke rapidly, and all the words that he employed were well pronounced, and all had a meaning, but they were so combined that the phrases were incomprehensible. Here are some examples, among others, of the replies which he made to my questions:

D.—“Have you tried to write?”

R.—“When I will have shown all the world opposite me, perhaps I would be able to speak myself.”

D.—“Have you had some visitors to-day?”

R.—“A little less than the others; it is my superior emission which does not wish it. It is that I am not able to reply that of which I have need.”

One day he showed me his urine, and attempted to make me understand that he desired to have it examined. I knew that he had been diabetic formerly, and that he had been cured. I said to him, then,—

“I understand. I will examine your urine.”

He replied,—

"It is probable that there will be nothing at all. There is nothing to fear. However, there is to fear that I have been a long time like that, but now there is nothing. However, I would wish to know if this time there is nothing to infinitude. I have suffered to an advanced degree when it happened."

Here the paraphasia was less incomprehensible, and for the ordinary affairs of life, the common forms of politeness, it did not exist. Thus, when, on entering, I said to him, by way of salutation,—

"Good-day, doctor; how are you to-day?"

He replied, and very correctly, with the following phrase:

"Quite well, thank you. Take a chair. How is madame?"

More frequently, as I have just told you, the sensory aphasiac speaks a sort of jargon, formed of words having sense, mixed with coined words, and more or less incomprehensible. It is this condition that we see in our present patient, as you can judge:

D.—"Where were you born?"

R.—"J'ai un mois de jalon, je suis enfant de la, oh, mon Dieu, quel malheur, du canandan, un petit quoi."

D.—"You were born at Isle-Adam?"

R.—"Oui, monsieur."

D.—"What was your father's occupation?"

R.—"Il était beignadan."

D.—"What was yours?"

R.—"Euh, mon Dieu, mon Dieu! Ça ne vient pas bien! disction. C'est un nom comme ça. J'étais conturmerier" (the patient was a tailor), etc.

I could present you other examples of difficulty of speech in the sensory aphasiac, but it seems to me that those which I have given you suffice to show you to what degree the spoken language, in this form of aphasia, differs from that of motor aphasia.

The disturbances shown by the writing are very marked in the sensory aphasiac, and it is easy to study them, for the sensory aphasiac is not hemiplegic, and makes use of his hands as does a man in perfect health. Observe these two specimens of writing; one was made by the physician whose history I have just related, the other by a workman who is tolerably well educated. Both have been able to write correctly only their names. The writing from dictation is null, the copying is very effective, and is executed mechanically. These patients, in reality, copy without understanding, and transcribe the printed letter by the printed letter. Very different in this respect is the agraphia in the cortical motor aphasia, in which the printed letters are copied in script, however altered either the spontaneous writing or that from dictation may be. In sensory aphasia, moreover, it is impossible to obtain from the patients a copy of any great length, and they require a considerable time—half an hour or an hour—to copy a few words. At other times—more rarely, however—the sensory aphasiac writes as he

speaks,—that is to say, he traces the words without connection, and the majority without signification; it is not agraphia, properly speaking, but paragraphia.

Usually the sensory aphasia—like the motor aphasia—appears to follow an attack of apoplexy. Where there are not repeated attacks, the word-deafness improves after some weeks or some months. The word-blindness is likewise not more permanent, and the patient soon understands many of the words that he reads. But the recovery is never complete, and if the aphasiac succeeds in understanding more or less the sense of the questions which are put to him in a loud voice, and by writing, he wearies soon, and there remains always a certain number of phrases which he does not understand. As to the trouble of the speech—paraphasia—and alterations of the writing,—these persist indefinitely. I have observed several of these patients during a period of three or four years; in the case of the man before you, the trouble has lasted more than three years, and I have never seen these disturbances disappear. It is proper to remember, besides, that in this form of aphasia the intelligence is often considerably involved. On the other hand, if the patient has been stricken in early life, the functional substitutions are easy; it is thus that the infantile cerebral hemiplegia does not leave in its train persisting sensory and motor aphasia, even when very extended cortical lesions exist. This is due to the cerebral adaptability, which is considerable at the commencement of life.

The majority of patients afflicted with sensory aphasia have a right lateral homonymous hemianopsia,—that is to say, they do not see in the right half of the visual field. At first the hemianopsia is difficult to establish, since the patient does not understand what is said to him, either by speech or writing. It should be searched for by rapid motion of some object to the right and left of the patient, and notice taken of the moment in which he performs movements of defence, etc.

I will not dwell a longer time on the differential diagnosis between sensory and motor aphasia. You will not be apt to confound a patient who does not speak, or who speaks little, in consequence of a lesion of the convolution of Broca, with a sensory aphasiac who speaks a great deal, but in an unintelligent manner, and in whom the comprehension of the spoken language fails, due to word-deafness. Remember, also, that if the difficulties of spontaneous or of dictated writing are almost the same in both patients, the writing from a copy is entirely different. The sensory aphasiac usually copies very badly, and by designing, letter by letter, the model which he has before him; the cortical motor aphasiac, on the other hand, copies very correctly, and, in transcribing, changes the printed form into script. Likewise, do not forget that the sensory aphasiac, previous to the works of Wernicke, was regarded as a patient afflicted simply with mental confusion,—a mistake which one could not make to-day.

You may have patients afflicted with total aphasia,—that is to say, subjects in whom all the language zone—third frontal, angular gyrus, first

temporal convolution—has been involved at the same time. In these cases the symptoms would be those of sensory aphasia combined with those of motor aphasia. The paraphasia would then fail, and the patient either would not pronounce a word, or would pronounce but a single word and always the same one. In these cases, contrary to that which exists in the sensory aphasiac, you will establish the existence of a right hemiplegia.

How are the effects of the lesions which involve the sensory aphasia to be interpreted?

You know that in right-handed persons—that is to say, in the immense majority of persons—the centres of the different memories which constitute the function of language—the auditory memory of words, the visual memory of words, the motor memory of articulation—are placed in the cortex of the left hemisphere. Likewise in left-handed persons these centres are placed in the right hemisphere. In the first temporal convolution—or in the convolution of Wernicke—and perhaps also in the second, the cortical centre of audition and the centre of the auditory images of words are found. If you understand the sense of the phrases which I pronounce before you in the course of this lecture, it is due to the fact that my speech arouses in you the auditory images of the corresponding words, hence the comprehension of the word, and, therefore, of the idea which it represents.

When the first temporal convolution is destroyed, the comprehension of the spoken word disappears and the patient is afflicted with word-deafness.

The integrity of the auditory images is of first importance in the art of speaking. The convolution of Broca is not in reality automatic; its normal function is dependent on the integrity of the auditory centres for words—the first temporal convolution—which acts as a regulator for it.

When this latter is impaired, the motor images of articulation, although intact, are not able to act regularly, and the patient, although he is able to speak, becomes paraphasic. The demonstration of this fact is due to Wernicke. We now know further—and I believe that I have contributed to establish this fact—that an isolated lesion of the angular gyrus, at the same time that it determines the word-blindness and the agraphia, involves also the function of the convolution of Broca, and determines the troubles of speech.

The word-blindness of sensory aphasia has an explanation not less easy. Remember that we do not read directly, but that we read by arousing our auditory and motor images,—that we read in spelling,—and it is because we read in spelling that the cortical motor aphasia presents, ordinarily, trouble in reading. The destruction of the auditory centre of words suffices to explain to you the alexia in the sensory aphasia, without taking into account that, in a number of cases of this affection, the angular gyrus—centre of visual images of letters and words—is equally involved by the lesion. Now, when these images have disappeared, the printed or

written words are seen as designs which have no further signification whatever.

As regards the hemianopsia which so frequently accompanies the sensory aphasia, it does not depend on the lesion of the angular gyrus, but on the penetration of this lesion into the depth of the brain substance as far as the optic radiations, which are then cut. The hemianopsia in the sensory aphasiac can fail, if the lesion of the angular gyrus does not extend into the tissue.

The sensory aphasia of Wernicke, of which I have just shown you a striking example, does not comprise all the clinical forms possible. There are in reality several forms of sensory aphasia, quite different from one another, which are studied to-day from several different points. In certain cases, the word-deafness being either hardly marked or much ameliorated, there exists only word-blindness with agraphia and some troubles of speech,—paraphasia or motor aphasia of mild form. This patient whom I present to you, and whom I have studied for two years, is a very remarkable example of this form, which I have designated by the term of word-blindness with agraphia and troubles of speech.

He is a workman, aged seventy-three, cultivated, and formerly could speak French and German correctly, could read and write well, as the information given concerning him, and the letters which I possess, written by his hand, bear testimony. On the 31st of December, 1889, he was attacked with giddiness, following which he had some difficulty in speaking, and was able neither to read nor write. He entered Bicêtre in January, 1892, and showed at that time the same symptoms which he presents to-day,—namely, motor aphasia, word-blindness, total agraphia, and traces of word-deafness.

As you can prove for yourselves, word-deafness is scarcely appreciable in this man. You perceive that he understands well the questions which I put to him, but you also perceive that sometimes—and on certain days the phenomenon is more marked than on others—he regards you with the air of a man who does not understand completely what is demanded of him. But, at all events, it is a very mild and inconstant phenomenon in this case.

The speech, on the other hand, is quite seriously disturbed. The number of words at the disposal of this man is limited. It is difficult for him, as you can see, to construct a phrase of moderate length. He stops in order to say, "I cannot, I know well, but I can't say it." Here, consequently, the difficulty of speech is analogous to that which one encounters in the motor aphasia, for this patient is not paraphasic.

The word-blindness with him is complete. Except his name and his given name, which he recognized from the first, he does not understand any word, written or printed. He recognizes, however, a fair number of letters and is able to name them, but the words formed by them have no sense for him. Therefore, in this case, conformably to what one observes

usually, the word-blindness is not accompanied by literal blindness. The examination of the visual field, measured by the perimeter, shows the existence of a right lateral homonymous hemianopsia, with considerable diminution in the remaining halves of the visual field. Finally, in this man there exists neither psychical blindness nor optic aphasia, and the other special senses are intact, as well as the general sensibility.

The difficulty in writing, which is easy to study in this case,—for this patient does not present a trace of hemiplegia of either side of the body,—is very marked, and corresponds to that which one observes when the angular gyrus is destroyed. This patient writes spontaneously his name and his given name—Dubuis Jules—correctly and with a flourish of the pen, as you see. At the sight of this signature, which is so correct, one could not believe at first that this man is agraphic; yet he is so for all words except his name and first name; when he is told to write anything, he traces on the paper illegible characters, veritable pen-tracks, saying, at the same time, “I cannot write.” The writing from dictation is the same; it is abolished. As to the copying, it is done in an entirely mechanical manner. This man copies the printed letters as print, drawing line by line very slowly, and stops, without finishing the letter, as soon as the model is withdrawn. See how he has copied the word EDITION, taken from a newspaper! First he has drawn the double outline of each letter, then he has blackened the interspaces, so as to reproduce in black exactly the thickness of each line. This manner of copying, it may be said in passing, is only found in sensory aphasia, for the cortical motor aphasiac never copies mechanically, in drawing from the model, but always changes the printed form into script.

This form of word-blindness with agraphia and difficulty in speech is only a variety of sensory aphasia, and corresponds to a lesion of the angular gyrus, a fact which I have helped to establish. I consider the angular gyrus as the centre of the visual images of words, and the facts reported by Banti, Berkhan, Sérieux, and Souques are confirmative of this opinion. When the angular gyrus is destroyed, or, in other terms, when the visual images of the words have disappeared, there is nothing astonishing in the fact that the patient becomes agraphic, since the act of writing—as Wernicke has pointed out—is only the transcription of the optic images of the letters and words stored up in our brain. Besides, as the angular gyrus forms a part of the zone of language, it is easily understood that its destruction involves not only word-blindness and agraphia, of which I have just spoken, but also disturbance in the spoken language,—paraphasia,—usually mild, or even, as in our patient, motor aphasia.

There exists another form of word-blindness, which I have designated by the name of pure word-blindness with integrity of the spontaneous and dictated writing. Here the word-blindness and the hemianopsia are the same as in the preceding form, but the mode of writing is entirely different. In pure word-blindness, the patient writes spontaneously and at dictation, as

in the normal condition, naturally without being able to read it; but a copy is altered and is made mechanically. The speech and intelligence are intact. This form of pure word-blindness arises, as I have shown, from a special localization, situated outside of the zone of language. Here, in reality, the lesion is situated in the region of the general vision-occipital point,—cuneus, lingual, and fusiform lobules,—involving the fibres uniting the angular gyrus with the general visual centre.

In the normal condition, if one understands what is read, it is because there is no interruption between the retina and the angular gyrus. The impression of a letter reaches, so to speak, the centre of general visual memory as a design. In order that this letter may be understood as a phonetic sign, it is necessary that this centre communicate with the angular gyrus. There the impression of the letter awakens the corresponding visual image, and this letter, in its turn, awakens the idea of the word-auditory and motor images. The pure word-blindness is, in reality, caused by a lesion situated outside of the domain of language. This lesion occupied in one of my patients the point of the occipital lobe, the base of the cuneus, the lingual and fusiform lobules. This man, very intelligent and very cultivated, was afflicted with total word-blindness and with hemianopsia, but there was integrity of the spontaneous and dictated writing. In him there existed also musical blindness, for, although he had been a very good musician before he was afflicted with word-blindness, he had become entirely incapable of deciphering a single note. He had, on the other hand, preserved the reading of figures, likewise the faculty of calculating. The speech, as well as the intelligence, was intact, and there did not exist a trace of word-deafness. Similar cases which presented the same anatomical localization have been reported by Wyllie and Redlich.

Just as there exist two forms of word-blindness, there also exist two forms of word-deafness. One is only the ordinary sensory aphasia, of which I have previously given the symptomatology. The other is what has been described under the name of pure word-deafness, and of which *Sérieux* has recently reported a very beautiful clinical example. It is quite rare. In this form the patient does not understand the questions asked in a loud voice, and is not able to write from dictation. These are the only symptoms which he presents. He understands writing—it is the only means of entering into communication with him—and replies correctly, in a loud voice, to the questions which are asked of him on paper. The spontaneous writing and copying are normal, and only the writing from dictation is impossible, which is due to the existence of the word-deafness. The intelligence is intact. The anatomical localization of the pure word-deafness is not yet established, but it appears logical to admit that it arises from a lesion separating the general centre of audition from the convolution of *Wernicke*, or first left temporal convolution (centre of the auditory images of words).

In resuming, we must actually divide the sensory aphasia into two

grand categories, according as the lesion from which it arises is or is not located in the zone of language.

In the first we find,—

1. The classical sensory aphasia of Wernicke, produced by a lesion of the first temporal convolution and of the supramarginal gyrus.

2. Word-blindness either with agraphia or very marked alteration of the writing, arising from a lesion of the angular gyrus. The second category comprises pure word-blindness with integrity of the writing, both spontaneous and from dictation, and pure word-deafness. Here the zone of language is intact.

This fact is demonstrated for pure word-blindness, and it is more than probable that it is the same for pure word-deafness.

REVIEW OF MEDICINE.

MEDICINE.

IN CHARGE OF JOHN H. MUSSER, M.D.,

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The Prophylaxis of Tuberculosis and its Beneficial Results in Germany. (*Berliner klinische Wochenschrift*, May 20, 1895.) By Professor G. Cornet, M.D.

This, the second paper on the prophylaxis of tuberculosis which Cornet has read before the *Berliner medicinische Wochenschrift*, contains, besides a condensation of much of his former work, the interesting and agreeable statement that the prophylactic measures already adopted by the people of Germany are beginning to have an effect both in lowering the annual mortality from this disease and in lessening the proportion of consumptives to the population at large.

As long as the ubiquity of the bacillus of tuberculosis was held, attempts at prophylaxis were rendered practically useless. The first experiments of Cornet showed, however, that we have in the intraperitoneal inoculation of guinea-pigs a sure means of diagnosing even a minute number of tubercle bacilli in dust. Large quantities of dust collected from fifty thousand litres of air were found by this method to contain no tubercle bacilli. Even in closed rooms, in spite of the presence of consumptives, the bacilli were not found, if the patients were careful of their secretions. Indeed,

they were only found when such secretions were allowed to become dry. Since then these experiments have been abundantly confirmed by other observers.

The parasitic character of the tubercle bacillus is shown: first, under ordinary conditions of nutrition they do not multiply; second, for their culture they require a higher temperature than is usually to be found in nature; and, third, even when the above conditions are supplied, the energetic and quickly-growing saprophytes may destroy the slowly-growing bacilli by using up their nourishing material. An increase of the tubercle bacillus out of the human or animal organism would, therefore, seem to be impossible under ordinary conditions. In consequence of numerous physical experiments the conclusion was reached that the passage of even a strong current of air over moist surfaces containing tubercle bacilli did not cause the bacilli to be taken up into the air,—*i.e.*, their presence could not be demonstrated in the air. Furthermore, the respired air passing from the tuberculous lungs of those affected did not show the presence of the bacilli. From these important and now well-known experiments the conclusion is drawn that the danger of infection rests alone in the secretions or excretions. Even here are further limitations, as shown by over two thousand experiments of the author. The tubercle bacilli cause the first and greatest change at their point of entrance into the body, or in the near-lying lymphatic structures. From pathological studies, by far the most usual points of entry in man are the lungs and bronchial glands. As the bacilli in the fæces are quickly destroyed by the presence of other organisms, we have in sputum, and this when in the dry form, nearly the only cause for the spread of tuberculosis of the lungs. It is also a question how much dried sputum may have to do with other forms of tuberculosis. "At least," says Cornet, "this much remains certain: if it happens that even a certain percentage only of virulent tuberculous sputum can be prevented from reaching a dry state, so with mathematical precision the per cent. of new cases of tuberculosis of the lungs must diminish." Therefore, to prevent the drying of the sputum seems to be the best means of overcoming the spread of tuberculosis. Thus, as to prophylaxis Cornet differs very largely from those who would pass stringent laws to prevent the spread of tuberculosis, such as the prohibition of the marriage of consumptives, in order to avoid the hypothetical inheritance of the disease, strictly enforced isolation, the removing of children from tuberculous parents, and other such severe rules which are impracticable, and would go so deeply into the social conditions of man.

The statement that one-seventh of all persons die from tuberculosis and that one-third of all the world are tuberculous leads to false conclusions. The average length of time of the disease for a grown person is hardly over three years. By the following table it will be seen that between the ages of five and ten years there is only one tuberculous boy among two thousand one hundred and seventy-nine, while between the ages of thirty

and forty years, there is one in ninety-five, and between sixty and seventy years, one in forty-three.

TABLE I. (PRUSSIA, 1891-92.)

AGE IN YEARS.	NUMBER OF PERSONS.		DEATH FROM ALL CAUSES TO 10,000 LIVING PERSONS.		DEATH FROM TUBERCULOSIS TO 10,000 LIVING PERSONS.			ABSOLUTE NUMBER OF LIVING PERSONS WITH TUBERCULOSIS.		ONE TUBERCULOUS PERSON COMES IN CONTACT WITH	
	Male.	Female.	Male.	Female.	Male.	Female.	Length of Time of Probable Sickness.	Male.	Female.	Male.	Female.
0-1	474,694.5	463,435.0	2,452.2	2,223.9	28.8	23.6	1	1,369.5	1,094.0	347	424
1-2	406,753.0	402,208.0	641.8	617.0	22.5	20.8	1	915.0	885.5	445	481
2-3	396,877.5	392,127.0	276.4	269.7	11.9	12.1	1	472.5	472.5	840	830
3-5	776,998.0	768,751.0	156.4	155.8	6.6	7.8	1	511.0	596.5	1521	1289
5-10	1,726,560.0	1,709,271.5	66.2	68.5	4.6	6.1	1	792.5	1,036.0	2179	1650
10-15	1,647,972.5	1,625,688.5	31.0	36.0	5.3	10.0	2	1,735.0	3,246.0	950	501
15-20	1,503,665.5	1,498,596.0	46.5	41.3	16.7	19.1	3	7,503.0	8,559.0	200	175
20-25	1,234,442.0	1,290,676.5	62.5	57.6	27.9	22.6	3	10,339.5	8,746.5	119	148
25-30	1,143,482.0	1,192,886.0	64.8	64.9	29.4	27.8	3	10,062.0	9,948.0	114	120
30-40	1,909,957.5	1,984,224.5	88.4	84.2	35.3	31.9	3	20,226.0	18,957.0	94	105
40-50	1,478,395.0	1,587,998	146.7	107.5	45.9	31.2	3	20,367.0	14,838.0	73	107
50-60	1,082,834.0	1,210,231.0	253.7	191.2	60.8	39.5	3	19,761.0	14,340.0	55	84
60-70	690,368.5	811,522	505.2	453.0	76.8	53.8	3	15,910.5	13,092.0	43	62
70-80	311,221.5	374,162	1,097.7	1,053.3	54.8	37.7	3	5,116.5	4,256.0	61	88
Over 80	51,864.0	70,641.0	2,435.1	2,292.1	22.2	16.0	3	345.0	339.0	150	208
Unknown	1,577.5	1,898.0	.....	.....	.....	.....	.....	115,426	100,336	.....	.....
Total	14,837,664.6	15,384,316.0	245.3	219.7	28.0	23.9	.....	.....	.....	128.5	153.3

Especial attention has been given to prophylactic measures in the prisons and insane asylums of Prussia. While the time is too short to draw accurate conclusions, still, to encourage those who may be tiring in their efforts without seeing any result, the author has prepared some tables which should certainly encourage all to continue the fight against this great enemy of mankind, when the prophylaxis after all is so simple.

TABLE II.

There died in the prisons from tuberculosis in proportion to 10,000 living.

PRUSSIA.		BAVARIA.	
Years.		Years.	
1875, 1876-1877, 1878	118.9	1876-1878	229.1
1878, 1879-1880, 1881	140.8	1879-1881	213.0
1881, 1882-1883, 1884	146.6	1882-1884	158.9
1884, 1885-1886, 1887	174.7	1885-1887	184.1
1887, 1888-1889, 1890	101.0	1888-1890	159.4
1890, 1891-1891, 1892	89.35	1891	153.1
1892, 1893-1893, 1894	81.15	1892	129.5

Prophylactic measures were not taken so early in Bavaria as in Prussia, hence the beneficial results are first seen later.

TABLE III.

There died in the insane asylums in proportion to 10,000 living.

PRUSSIA.

Year.	Year.
1880.....204.5	1887.....180.8
1881.....192.1	1888.....184.0
1882.....189.9	1889.....155.3
1883.....193.6	1890.....152.9
1884.....196.4	1891.....156.0
1885.....195.7	1892.....?
1886.....198.5	

In Prussia, in the years 1887-1893, about seventy thousand persons less died from tuberculosis than statistics drawn from former years would have led one to suppose. The same good result is seen in Hamburg, but not in other cities of Germany where prophylactic measures were not pushed or taken up but lately. "Where persons do not know how to take care of themselves, the state must take energetic means to protect others."

Virchow, in discussing the paper, spoke of the indifference of the people at large to this important subject, and remarked upon the great difficulty, ending in failure, which he had when Rector of the Berlin University, in trying to get the students, supposed to come from the best homes of Germany, to use the spittoons, which were placed in convenient places. He then spoke of the danger of drawing conclusions from such statistics, and thought that the favorable results cited by Cornet were more hopeful than was warranted by the present state of affairs.

Polyuria due to Tubercular Peritonitis. (*Southern Medical Record*, May, 1895.) By William S. Gordon, M.D., of Richmond, Va.

The author reports the case of a negro child, aged six, suffering from tubercular peritonitis, who drank from a half gallon to a gallon of water daily and who passed an equal quantity of urine. The analysis of the urine showed the specific gravity to be 1.000, reaction acid, and the absence of albumin, sugar, and phosphates. In this case the abdominal symptoms were not marked until rather late in the course of the disease, and it is interesting to note the occurrence of the polyuria in spite of the absence of these symptoms. It is believed by the author that abdominal disease leads to polyuria by pressure upon the abdominal blood-vessels or by stimulation of the abdominal vaso-constrictor nerves, thus increasing renal blood pressure.

A Contribution to the Study of the Etiology of Membranous Rhinitis. (*Medical News*, May 18 and 25, 1895.) By Mazÿck P. Ravenel, M.D., of Philadelphia.

It is only within the past few years that the disease known as mem-

branous rhinitis, *rhinitis fibrinosa*, has attracted the attention of bacteriologists. The course of the ailment is almost invariably benign, though tending to be chronic, and the constitutional symptoms are very slight. Bacteriological investigation has shown clearly that in the great majority of cases the Klebs-Löffler bacillus is present in the membrane in the nose and in the nasal discharges. The organism found in these cases often possesses a high degree of virulence, and the most virulent cultures have more than once been obtained from patients in whom the general disturbance was very slight or entirely absent. The disease is a form of nasal diphtheria, and a patient is always a possible source of contagion, and should be isolated as carefully as are those affected with the more common types of diphtheria, until cultural methods have proven them to be free from the Klebs-Löffler bacillus. There is, however, a condition clinically identical with membranous rhinitis, in which the Klebs-Löffler bacillus cannot be demonstrated, and which depends upon some other organism. Cases presenting the Klebs-Löffler bacillus, even of a virulent type, seem to lack in infecting power, and this is probably due to the feeble vitality of the organism. When infection does occur, the resulting disease is membranous rhinitis rather than the ordinary forms of diphtheria. Fourteen cases of membranous rhinitis are reported, in all of which bacteriological examination was made. Klebs-Löffler bacilli were found in ten of these cases. Of the four remaining cases, organisms resembling the diphtheria bacillus were found in two; but they failed to answer to one or more of the morphological characteristics of this organism. In one case only a coccus was found on bacteriological examination, and in the fourth case the cultures were not made until there had been involvement of the throat, then, however, Klebs-Löffler bacilli were obtained. The occurrence of a pseudo-diphtheria bacillus was constantly borne in mind, and in every case the organism found was undoubtedly the true Klebs-Löffler bacillus which had in some way become modified in virulence and vitality. A careful review of the literature of the disease results in finding seventy-seven cases. In forty-one of these there is a clear record of bacteriological examination, and in thirty-three the Klebs-Löffler bacillus was found.

The Relation existing between Cholelithiasis and Hepatic Abscess.
(*Maryland Medical Journal*, May 25, 1895.) By W. M. Lewis, M.D., of Baltimore.

A patient presented himself for treatment for the relief of pain in the abdomen. There was no icterus and there had been no clay-colored stools; but there was tenderness in the right iliac fossa, which extended up towards the liver, and in the region of the hepatic flexure of the colon there was slight dulness on percussion. About twelve days later hectic manifestations supervened and a tumor was observed in the right hypochondriac region, rapidly increasing in size, the dulness of which merged directly into that of the liver. Abscess of the liver was diagnosed, an operation performed,

and an abscess found immediately over the gall-bladder. This abscess was evacuated, as was the gall-bladder, and a stone was removed from the cystic duct, which presented three facets from which the presence of another stone was suspected but could not be determined at the time of operation. The patient died from shock, and at the autopsy a second abscess was found in the anterior border of the right lobe and the second gall-stone was found occluding the cystic duct. The fluid evacuated from the gall-bladder was muco-serous in character; while a microscopic examination of that from the abscess failed to reveal the presence of amœbæ. The diagnosis of this case was to be made from appendicitis and from typhoid fever. A blood examination excluded the latter diagnosis for there was observed the presence of a marked leucocytosis, a condition not seen in typhoid fever. From appendicitis the distinction was made by the disappearance of pain from the ileo-cæcal region, and by the absence of a tumor. A second case is reported in which a sudden diminution of the amount of urine secreted was attended by symptoms pointing to the diagnosis of cholelithiasis or of peritonitis. Here, again, the presence of slight leucocytosis excluded the latter and made the former more probable. The diagnosis was confirmed later by the occurrence of jaundice and the passage of a clay-colored stool containing a piece of inspissated bile. One lesson to be learned from the study of these cases is the importance of an examination of the blood in obscure cases. A second lesson is the importance to be attached to a sudden decrease in the amount of urine excreted. A third lesson is the necessity for greater care in the examination of the patient with reference to the diagnosis of the disease. Several cases of hepatic abscess have been reported occurring in connection with biliary calculi. The inflammation and ulceration of the biliary passages due to the presence of these concretions are frequently the cause of these abscesses.

Methods of Chest-Examination Supplementary to Auscultation and Percussion. (*Boston Medical and Surgical Journal*, April 11, 1895.)
By Edward O. Otis, M.D., of Boston.

Experience, gained in the examination of over fifteen hundred chests of presumably well persons, has demonstrated that the means of determining the condition of the lungs other than auscultation and percussion are exceedingly valuable and add, not inconsiderably, to the knowledge obtained by the latter methods. Moreover, they are applicable to most cases which consult us for suspected lung-trouble. The methods are of especial value in those incipient or suspected cases before we obtain any positive evidence of disease by auscultation and percussion; a class of cases in which any and all means of examination which will lead to a diagnosis should be employed; for the earlier the diagnosis is made and treatment begun the better the prospect of arrest. Further, these methods naturally suggest a valuable means of treatment,—namely, gymnastic exercise especially directed to chest and lung expansion. Spirometry is the measure of the

ordinary amount of air in the lungs. This capacity varies according to age, sex, and stature; according to the height, width, and depth of the chest; according to the mobility of the chest walls; and according as one has or has not been in the habit of fully expanding the lungs. In males between sixteen and forty years of age, for each inch in height the lung capacity is 3.5 cubic inches, or a total lung capacity of 244.44 cubic inches in an individual sixty-eight inches tall. In women of an average age, of nineteen years, for each inch in height the lung capacity is 2.3 cubic inches, or a total lung capacity of 145.3 cubic inches in an individual 63.2 inches tall. With these data, then, knowing the height, we can estimate pretty nearly how much the lung capacity of the individual ought to be. If the lung capacity falls much below the normal on a spirometric test, either the patient's method of inspiration is faulty or his lungs are not normal. If some of the lung tissue is disabled and thrown out of use and the evidence from auscultation and percussion is negative, there will be certain suspicious general symptoms present, and a spirometric test, should it fail to come up to the average by a considerable degree, will confirm one's suspicions as to the integrity of the lung tissue. In patients with incipient pulmonary tuberculosis the lung capacity was found to be much below the average. If there be general symptoms suggestive of tubercular trouble and the vital capacity is found to be up to or above the average, it is a favorable piece of evidence against actual lung invasion. If the diagnosis of the tubercular invasion has been established, the test of the vital capacity is a factor of more or less value in forming a prognosis. Pneumatometry is the measure of the elastic power of the lungs or the strength of the lung tissue. This power may be measured either on inspiration or on expiration. An ordinary steam-gauge made for recording low pressures may be used. There is no constant ratio between the expiratory force and the lung capacity. The value of the test is as a gymnastic exercise. Thoracometry is the measure of the circumference and of the diameters of the chest,—depth and breadth,—both in natural and full inspiration; and includes tracings of the contour of the chest, also in natural and in full inspiration. Two circumferences of the chest are taken; one at the level of the nipples, and the other about two inches below, the “respiratory chest” so-called. These measurements may be taken in extreme inspiration, extreme expiration, and in calm breathing. The important fact to be ascertained is the mobility of the chest walls as a whole. To determine the amount of excursion of the chest wall we measure the antero-posterior and lateral diameters both in repose and in full inspiration. The symmetry or asymmetry of the respiratory movements is told by a simple band of lead with a rubber hinge or by the more complicated and accurate apparatus of D  m  ny, of Paris. The contour of the chest is first taken in repose, and charted; superimposed upon this is the shape of the chest when fully expanded. Taken by themselves, these tests have a very limited value; but the sum total of them gives very valuable evidence. By an examination of

this kind one gets into the habit of looking at the patient physiologically as well as pathologically.

The Influence of Asphyxiated Blood and some Poisons upon the Contractility of the Lymphatic Vessels. (*Le Progrès Médical*, May 18, 1895.) By MM. E. Gley and L. Camus.

These gentlemen have continued their researches upon the lymphatic vessels by the graphic method and have studied the action of asphyxiated blood, of pilocarpine, and of atropine on the thoracic duct and on the receptaculum chyli. A few minutes after the beginning of asphyxia, the thoracic duct and the receptaculum chyli contract and the movements of the latter increase the flow of the lymph, in spite of the slight obstacle interposed by the narrowing of the thoracic duct. Pilocarpine increases the constriction; atropine relaxes the walls of the thoracic duct. These substances act here, as upon the heart and stomach, by the intervention of antagonistic nerves. Pilocarpine stimulates the vaso-constrictor nerves, while atropine paralyzes them, stimulating the dilator fibres. Curare also relaxes the walls of the thoracic duct. The lymphatic circulation ought, therefore, to be influenced as the circulation of the blood by the action of poisons which modify the calibre of the vessels.

Irregular or Atypical Gout,—How shall we know it? (*Journal of the American Medical Association*, June 8, 1895.) By James Tyson, M.D., of Philadelphia.

The writer holds that in the majority of instances of atypical gout a correct diagnosis can be made, and he gives data which will aid in determining the etiological relations of certain ailments to it. These gouty ailments include dyspepsia, headache, follicular inflammation, asthma, bronchitis, tonsillitis and pharyngitis, various skin affections, various psychopathies, and in fact there is scarcely a form of visceral or external pain or functional or organic derangement which has not been by some one or other declared to be gouty in origin. In view of these facts some criteria must be established by which we may judge whether the ailments mentioned, which so evidently arise from many causes, are due to gout or not. If uric-acidæmia can be demonstrated to be present, it is strong presumptive evidence that any one of these events is gouty. This can only be determined by blood analysis. The supervention of an attack of regular gout simultaneously with subsidence of some one of the ailments named is almost conclusive evidence, let the ailment be almost what it may. The history of previous attacks of regular gout must be taken in connection with the absence or presence of other causes capable of producing the same ailment. Hereditary tendency to gout must be similarly considered. The history of exposure to lead-poisoning is important on account of the association of plumbism with gout, or saturnine gout, as it is called, also the history of a habit or mode of life which furnishes the conditions of acquired

gout, and the constant presence of a highly-colored, scanty urine of high specific gravity, with a tendency to lateritious sediments and uric acid gravel. These characteristics of the urine and many symptoms found in gout are also found in lithæmia, but the resemblance stops at the joint affections. In lithæmia there are no tophaceous deposits. The presence of glycosuria in association with gout, or in alternation with it, or in certain members of gouty families, is an undoubted fact, and establishes a very close relation between these two conditions. Finally, here, as in so many other cases, therapeutics come into play as a factor in determining the nature of the ailment. Should such a condition be relieved by the typical treatment for a gouty paroxysm, its gouty nature may be regarded as established.

Systemic Dissemination of Tuberculosis from a Patch of Lupus Vulgaris. (*Medical Review*, May 25, 1895.) By Robert Peter, M.D., of Toledo, Ohio.

The patient was a white man, aged fifty-eight, who had suffered from a patch of lupus vulgaris, situated just below the left ear, for ten years. The patch gradually spread until it destroyed the lobule of the ear and the tissues in front of the auricle. It finally broke through the junction of the aural cartilage and penetrated the anterior temporal vein. The hemorrhage was considerable; but was finally fully controlled, and the patient continued for a year without further change. At the end of that time he had an attack, which was diagnosed typhoid fever, and from which he seemed never to fully recover. His condition passed into one of peevishness, slight hectic fever, colliquative sweats, and emaciation. Then there was developed a synovitis of the knee, with thickening of the condyles of the femur, and later a cold abscess appeared in the renal region, which was evacuated. Both these processes were probably tubercular. Physical examination of the chest did not reveal anything positive. The important lesson taught us by this case is that general tuberculosis can be established by dissemination from a local process of lupus vulgaris, and this lesion should always be designated as tuberculosis of the skin. The author asks the very pertinent question, Is it not probable that the lupus patch was engrafted by inoculation from a contaminated razor? The matter awakens practical interest by the relation it bears to the arguments in favor of requiring barbers to sterilize their razors and sponges.

Primary Cancer of the Gall-Bladder. (*Canadian Practitioner*, May, 1895.) By J. E. Graham, M.R.C.P. (Lond.), of Toronto.

A Welshman, aged forty-five, presented himself for treatment, complaining of bilious attacks brought on by indulgence in certain kinds of food, the prominent symptoms of which were nausea and the vomiting of a deeply-stained material. There was a history of an attack of biliary colic three years previously. The present attack began with pain and

tenderness over the region of the liver, with nausea. Soon the patient noticed a nodule below the liver margin, and following this the liver was noticed to be gradually enlarging and nodules could be felt on its surface. There had been jaundice; but this symptom gradually faded. There was no pain in the stomach. On examination the nodules on the surface of the liver could be felt distinctly and the nodule below the liver margin was very clearly outlined and hard. Over these nodules could be heard distinct, rough, grating, friction-sounds on deep inspiration. These sounds were thought to be due to extensive perihepatitis; but at autopsy there was found to be but a small amount of peritoneal inflammation in the neighborhood of the nodules, and the sound must have been produced by the rubbing of the rough cancerous surface over the roughened peritoneum. The pain over the liver was extreme in a spot where a nodule was rapidly growing, and the development of a new nodule was always preceded by pain. There were 4,140,000 red blood-corpuscles. At autopsy the liver was found to weigh fourteen pounds. The nodules were secondary cancerous masses and the growth occurred by metastasis. The nodule felt below the liver, and which was the first one to develop, was a cancer of the gall-bladder and the primary seat of the disease. Calculi were found in the remains of the gall-bladder, near the cystic duct. Although there were distinct signs of the suppression of the bile-making function of the liver, leucin and tyrosin were not at any time found in the urine. This is probably explained by the limited diet taken by the patient. The diagnosis of primary carcinoma of the liver or gall-bladder was made during life because there was no history pointing to cancerous disease of the pylorus, cæcum, sigmoid flexure, or rectum; because there was a history of biliary colic with inflammation of the biliary passages; and because absence of marked jaundice excluded a primary affection of the biliary passages.

On the Diagnosis of Chronic Disorders of the Stomach. (*Medical Record*, June 1, 1895.) By H. Beck, M.D., of New York.

The wide complex of gastric disorders may be divided into acute and chronic, primary and secondary diseases. Passing over the acute affections, the remaining disorders may be divided into chronic primary and chronic secondary gastric diseases. Only those affections in which the cause of the trouble is to be found in the stomach itself are denominated primary; while as secondary those disorders are indicated in which the cause is located in some distant organ. The first requisite in the proper treatment of stomach disorders is doubtless a correct diagnosis; but a scientific diagnosis of these cases is not an easy thing to make. Before a scientific diagnosis can be given, a physical and chemical examination of the stomach and its contents should be made. For this purpose the stomach-tube should be used, and here lies the difficulty, for patients are not easily induced to submit to a washing of the stomach. In arriving at a correct opinion as to the nature of the case it is necessary to wash the stomach at least three times: first, in its

empty state; second, after a test-breakfast; and third, after a test-dinner. It is necessary to determine whether hyperacidia or anacidia of the gastric juice exists. For this determination a saturated, alcohol-etheric solution of tropeolin and Gunzburg's reagent are used. Microscopic examination of the material removed from the stomach would tell whether or not an inflammatory process were going on. If the contents of the empty stomach are found to be free from hydrochloric acid, pepsin, or mucus, and the reaction is neutral, an anatomical change of the mucous membrane is to be excluded and the ailment is to be considered a symptom of some indirect or nervous influence. The presence of a distinct acid reaction in the contents of the empty stomach is conclusive of gastrorrhœa acida, chronic acid catarrh, or round ventricular ulcer. A distinct alkaline reaction of the contents of the empty stomach is proof of mucous catarrh, atrophic catarrh, or cancer. In all these forms of disease we find, microscopically, inflammatory products in the shape of exudative white globules. The stomach-pump may be used to diagnose the motor condition of the organ and to estimate the size of the organ. The latter estimation is made by a very ingenious method of filling the stomach with water and noting the level to which the water rises in the neck of a glass funnel, which level is marked on the abdominal wall. The water is then drawn off and the lower level is marked on the abdominal wall. This method avoids the artificial lowering of the greater curvature. The Rosenthal pump is the most convenient instrument to use.

A Case of Hypertrophic Pulmonary Osteo-Arthropathy. (*British Medical Journal*, June 8, 1895.) By J. W. Springthorpe, M.D., of Melbourne.

The following train of symptoms was observed in a male patient, aged twenty-one, who presented a gouty and neurotic family history. The man had been perfectly healthy up to the age of ten, when he had an attack of right-sided pleurisy with effusion. This was followed by an attack which the family call typhoid fever, but which was probably an empyema. Later the patient showed some curvature of the spine and a skin disease which was undoubtedly ichthyosis. For the two years previous to the first observation there had been transient swelling of the feet, and this was followed by swelling of the stomach. When admitted to the Melbourne Hospital the right chest was very much flattened and retracted; the liver was enormously enlarged; there was a medium quantity of fluid in the abdomen; and the heart was considerably enlarged and presented a thrill and double murmurs at both the aortic and mitral areas. There was a marked curvature of the spine occupying the whole dorsal region. The sternum was displaced upward and to the left, the left ribs were higher than the right, and the head was carried well over towards the right side. In addition to general wasting, the pectoral muscles, the muscles of the scapulæ and of the upper arms were reduced almost to nothing. The skin over the abdomen,

arms, forearms, hands, thighs, knees, and ankles was thick, scaly, and livid-gray in color. The penis was of the size of that of a boy of about ten years of age. The scrotum was large; the cremasteric reflex was present; but there was no history of any erotic excitation at any time. Beneath the thickened epidermis of the legs and thighs was some œdema. There was noticeable enlargement with deformity of the extremities with general lengthening of all the long bones. Both hands were enlarged, being increased in length and not in breadth; the fingers were clubbed. The face presented no abnormalities. At the autopsy no valvular lesion of the heart was found. No thymus gland was noticed. The right pleural sac was one large abscess cavity still containing some pus. The left lung was small, engorged, and friable. The liver was enlarged and lardaceous; the spleen, fibroid and lardaceous; the kidneys, pale; and all the abdominal organs decomposing. The pituitary body appeared normal, and there was no increase in the size of the fossæ at the base of the skull. The disease is rare and is to be distinguished from acromegaly. The sequence of events in this case was as follows: a gouty and neurotic family history; an unrecognized empyema with adherent pericardium; extreme and permanent collapse of the lung, with consecutive dorsal curvature; finally, nutrition and development carried on under the double disadvantage of serious heart-disease and impaired oxygenation of the blood. This rare manifestation of disease may be the result of exceptional abnormality of development under the influence of continued and uncommon maloxxygenation of the blood. Such an hypothesis would explain, to some extent, why certain portions of the long bones are especially affected. It explains the extreme clubbing of the fingers, the deformity at the lower ends of the radius, ulna, femur, phalanges, tibia, and fibula, and the changes in the skin.

THERAPEUTICS.

IN CHARGE OF ALEXANDER D. BLACKADER, B.A., M.D.,

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ASSISTED BY

D. J. EVANS, M.D.

Physiological Action of Antidiphtheritic Serum. (*Lo Sperimentale*, April 11, 1895; *British Medical Journal*, May 18, 1895.)

Professor Mya has investigated the physiological action of the serum in the case of four children of varying ages, and suffering from slight ailments. As a result of the injection of the serum no noteworthy action on the circulatory apparatus was observed. No change was produced in the temperature, except in one case in which a scarlatiniform rash appeared. A slight increase in the quantity of the urine was observed, and also in the

amount of urea. The most obvious change was noted in the blood, and consisted in an increase of the white cells and diminution of the number of the red cells, shortly after the injection. The alteration was transitory, not lasting more than twenty-four to forty-eight hours, and was not accompanied by any alteration in the coloring matters of the urine. He does not think that this was due to any direct hæmolytic action of the serum, and is of the opinion that the serum exercises no noxious action which can be appreciated by our present modes of examination.

Arloing (*Lyon Médical*, June 2, 1895) investigated the action of the normal serum of a horse and of antidiphtheritic serum on healthy animals when given by subcutaneous injection. On healthy guinea-pigs, normal serum given daily to the extent of 0.5 cubic centimetre subcutaneously for a period of four weeks, and then increased to 0.75 cubic centimetre daily, and continued for another month, appeared to have a slight but distinctly prejudicial effect on nutrition. In a second batch of young growing guinea-pigs tested for forty-five days with antidiphtheritic serum, there was a sensible retardation of development, the animals tested showing only a gain of 44.5 per cent. in weight during this period as contrasted with a gain of 50 per cent. in the control animals during the same time.

The Therapeutical Value of Cocaine in Whooping-Cough. (*Lancet*, June 8, 1895.) By S. Russell Wells, M.B., and L. Gerard Carré, M.D.

The writers express the opinion that this disease is due to a microbe not as yet certainly determined, which has a local habitat in the respiratory mucous membrane, and that the catarrhal stage of the disease should be regarded as the period of microbic activity, and the whooping stage as due to the after-effect of a poison generated by the microbe. Consequently they consider as the best method of treatment the exhibition during the early stage of some drug which should destroy the microbe and counteract the effect of the poison. This, they think, owing to difficulties in the way of diagnosis and to our lack of knowledge, is for the present impracticable; so they look for a drug to antagonize the effect of the poison in its later stages. This drug should stimulate nerves antagonistic in action to those involved and lessen the sensibility of the peripheral terminations of the afferent nerves from the respiratory and gastric mucous membranes to the medulla. Such a drug they think they find in hydrochlorate of cocaine, which they recommend, not to be applied locally, but to be given internally in doses based on the standard of one grain for an adult three or four times a day. In this way they treated three hundred and twenty-three cases in the out-patient department of the great Ormond Street Hospital for Sick Children. The cases came under observation during the most unfavorable months of the year,—namely, the late autumn and early winter of 1894,—when one would expect the course of the disease to be as long and as unfavorable as it ever is. Under this treatment the average duration of the disease was only three weeks, although severe cases were more protracted.

The child, as a rule, after commencing treatment, showed marked improvement in its general condition, vomiting ceased, anorexia disappeared, the cough became less frequent, and sleep improved. No marked evil effects have been noticed by the writers to follow the use of the drug. Slight relaxation of the bowels appeared in some cases, but this they did not regard as having an untoward effect on the course of the disease. In most cases the children were kept under observation long after the symptoms of pertussis had ceased, so as to enable the observers to speak with certainty of the permanency of the cure.

The Use of Vaccine Serum in the Treatment of Variola. (*Medical News*, June 29, 1895.) By Llewellyn Eliot, M.D.

The writer refers to the experiments of Dr. Sternberg as to the power of blood serum from an immune calf, or from an individual who had recently suffered from variola, if injected into the subcutaneous tissues at the time of vaccination, to prevent the development of a characteristic vaccine vesicle. In these negative results were obtained, nevertheless Dr. Sternberg questions whether at the time a sufficient amount of the serum had been injected. Accordingly, at the request of Dr. Kenyon, who supplied him with serum from a calf recently vaccinated, but at the time perfectly well, he treated, during the recent epidemic, five cases of small-pox in hospital by this method. Four cases made excellent recovery; one, of very malignant type from the first, died. He gives the details of the cases and thinks, so far as he can judge from such a limited experience, that serum thus prepared modifies the course of the disease, influencing distinctly the character of the eruption, aborting or shortening its usual course, and in many cases preventing pitting.

Dr. E. H. Wilson (*Brooklyn Medical Journal*, July, 1895) also gives a similar experience with three cases treated in the Kingston Avenue Hospital with serum obtained from a healthy calf recently vaccinated. In these cases improvement set in shortly after the use of the serum, and it was thought that the attack had been distinctly modified by the serum treatment.

Argentamin and Argonin. (*Lancet*, July 6, 1895.)

As substitutes for ordinary aqueous solutions of nitrate of silver, two organic compounds have been recently introduced, which are said to have a still greater microbicidal action, and to be less irritating than the nitrate. Argentamin consists of a solution of ten parts of phosphate of silver, with an equal quantity of ethylene diamine, in a hundred parts of water. Thus prepared it neither precipitates albumen nor is it decomposed by sodium chloride. It is said by Dr. Schäffer, of Breslau, to act more energetically than silver nitrate solution of the same strength as a germicide. He found it of value as an injection in gonorrhœa. It has also been used with good results in glandular abscesses; but care must be used lest it produce too

great irritation. Argonin, a combination of silver with caseine, but containing only a fourth of the amount of silver that the nitrate does, is far less irritating to the tissues than argentamin, and, according to Dr. Meyer, of Breslau, has a remarkable microbicidal action, especially on the gonococcus. It is soluble in water, the solution being of a yellowish opalescent color, and gives no precipitate with sodium chloride.

The Effect of Peppermint Inhalation on Experimental Tuberculosis. (*New York Medical Journal*, May 18, 1895.) By Edward R. Baldwin, M.D.

A clinical trial of the peppermint treatment of phthisis, as described by Carasso, has been carried on at the Adirondack Sanitarium, while at the same time experiments under the direction of Dr. Fendreau have been undertaken at the laboratory, with the view of testing (1) the effect of the vapor of peppermint oil upon pure cultures of the tubercle bacillus; and (2) its influence on the course of the disease in animals inoculated *per tracheam* and kept in an atmosphere charged with the vapor. The results obtained appear to warrant the following conclusions: (1) Although oil of peppermint may prevent the bacillus from growing in a test-tube, its growth in an animal is not hindered by even constant inhalation of the strong vapor of peppermint; (2) although the peppermint oil has a high power of diffusion, its local antiseptic action in the respiratory tract is probably slight, both on the tubercle bacillus and on other bacteria.

On Salicin and Salicylates in the Treatment of Psoriasis and some other Skin Affections. (*Lancet*, June 8, 1895.) By H. Radcliffe Crocker, M.D.

The writer in this paper, which formed part of the introduction to a discussion on the internal therapeutics of psoriasis at the annual meeting of the British Dermatological Society, claims a very definite value for this treatment. He thinks that, under the great authority of the German school, attention has been directed too exclusively to mere local treatment in skin diseases. The discovery of the influence of thyroid extract was a startling reminder that the old humoral pathology is perhaps not yet dead, and may live again in a more exact and scientific form. He was first induced to prescribe the salicylates in a case of psoriasis accompanied by symptoms of tonsillitis. The improvement in the appearance of the patches from week to week was very remarkable. Since then he had given the salicylates an extensive trial, with results in many instances equally striking and conclusive, especially in those cases of *psoriasis guttata* of extensive and recent development, the very form unsuited for the exhibition of either thyroid extract or arsenic. Under the influence of the drug he observed a diminution of the hyperæmia, the scales were no longer formed abundantly, while the old crusts became easily detached, leaving a pale-red surface which became smoother from week to week. Should the drug produce any gastro-

intestinal irritation, an aggravation of the psoriasis may result, requiring the administration of an alkaline sedative for a few days, when the salicylates may be resumed in smaller doses. He claims also for the salicylates much success in the treatment of the various forms of erythema multiforme, and also in erythema nodosum, and mentions one case of lupus erythematosus in which striking improvement followed their administration. He sums up a very interesting paper as follows: Salicylate of soda and probably salicin and its derivatives are of great value in psoriasis, especially during the period of active development, and in hyperæmic cases which are unsuitable, as a rule, for both arsenic and thyroid extract. They are useful in all forms of the disease, except, perhaps, in old chronic patches, but their administration must be temporarily stopped if they give rise to any dyspeptic symptoms.

SURGERY.

IN CHARGE OF HENRY R. WHARTON, M.D.,

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AND

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Clinical Observations on the Cure of Cancer by Cancer Serum (Erysipelas Serum). (*Deutsche medicinische Wochenschrift*, April 25, 1895.) By Professor Emmerich and Dr. Scholl.

It has been frequently observed by various authors of all nationalities that an intercurrent attack of erysipelas may produce a cure in a cancer or sarcoma, and repeated and accurate observations make this a certain fact. Fehleisen and Weisser injected virulent pure cultures of the cocci of erysipelas into cases of cancer that were hopeless, and produced unquestionably good results. This method, however, was not without danger.

Virulent bouillon cultures of the cocci of erysipelas, either sterilized by raising to a temperature of 100° C. or filtered through a bacterial filter, have been employed by Coley with good results in cases of sarcoma. He found, also, that the addition of a culture of the bacillus prodigiosus to the bouillon, under certain conditions, increased its efficiency. There were, however, some complications and symptoms that were not all that could be desired.

Emmerich, in his experiments, found that the cocci of erysipelas produce certain changes in the blood that cause the destruction of the anthrax bacillus, and so proved that anthrax is curable by the use of serum derived from animals previously infected with erysipelas. The efficiency of serum

therapy has since been established by the work of Mastbaum in swine cholera and of Behring and Kitasato in diphtheria.

The action of all the serum therapies, these authors believe, is similar to that which Emmerich proved in the case of erysipelas and anthrax, and is due to an action of the serum through the blood upon the micro-organisms which produce the disease. These authors would also attribute to the cancer serum a direct analogous action upon the germ or poison that produces cancer. The serum is best produced from sheep that have been inoculated with erysipelas, the serum drawn off, and the cocci removed by an efficient filter.

The authors report in detail six cases, and in all of the cases treated they have seen but two that were not cured; these were suppurative cases that had recurred. If they had been treated earlier, it is thought that the result would have been better.

The authors believe that the cancer serum is a specific in cancer, and probably in sarcoma. They have proved it a specific in all cases, in skin cancer as well as in involved glands. The age rather than the form of the cancer has been of the greatest importance. The earlier the cancer is treated the more certain and more rapid is the healing. The amount of serum injected varies, with the size of the tumor, from fifteen minims to one drachm, and in larger tumors even six drachms may be required, and is injected into different parts of the tumor. There is but slight reaction and little pain, except in large tumors. Fever is generally absent except in cases where large amounts are used, and is then not great, and lasts but a few hours. There have been no untoward accompanying symptoms. The result seen is an aseptic erysipelatous swelling with slight redness. This is never as intense as a true erysipelatous swelling and extends only to a slight distance beyond the tumor. When the injections are discontinued the swelling disappears in from twenty-four to forty-eight hours.

The Possibility of the Disinfection of Wounds. (*Deutsche medicinische Wochenschrift*, No 8, 1895.) By Dr. Haenel.

In his research on this subject the author studied the effect produced by infecting a wound, otherwise aseptic, with matter of known virulence containing streptococci and staphylococci. The tampons were allowed to remain in for times varying from four to eighteen hours; the wound was then washed out with either a three-per-cent. carbolic or a six-per-cent. salt solution; it was then packed with moist packing and covered with a moist dressing, which was changed daily, the wound being washed out each time. Six guinea-pigs of the forty-four used in the experiment were kept as a control and nothing but aseptic gauze was used on the wound. The recovery was very nearly similar in each case. There was not the slightest difference in the course of healing as seen in the wounds treated with carbolic and those treated with common salt solution. If the virulence of the infection was very great the case was acute and death followed rapidly. In

the more chronic cases of suppuration there was no noticeable difference in the intensity of the symptoms or in the length of time required for recovery.

The author believes that his researches support the opinion that a disinfection of living tissues with chemical agents is impossible. The requisites for healing are free drainage for secretions, the holding of the wound wide open, and an outward flow of the osmotic secretions into the dressings.

Total Gastrectomy in a Cat.—At the Société de Biologie, June 1, 1895, Pachon (*Gazette médicale de Paris*, June 8, 1895) showed the specimen from a cat in which a total gastrectomy had been performed. In spite of gavage the animal died from inanition three months after the operation. The digestive power was good, but the animal showed a distaste for all food.

The Use of Torsion instead of Ligatures. (*Medical Record*, June 29, 1895.) By John F. Erdmann, M.D., of New York.

This author strongly advocates the use of torsion in checking hemorrhage from divided vessels. He says that by its use we dispose of the ligatures, which act as foreign bodies, and which are very likely to be a source of irritation and also a possible means of infection, and also prevent hemorrhage due to an imperfectly tied knot or slipping of the knot due to the conditions of the ligature. Primary union is more apt to follow by this method and secondary hemorrhage naturally will occur with less frequency.

Limited torsion is done by grasping the bleeding point with an ordinary artery clamp, then drawing the artery out and clearing it for a short distance of all surrounding tissues, then grasping the proximal end of the cleared portions between another pair of forceps, or between the thumb and a finger for a point of limitation to the twisting, and then giving the distal forceps four to eight turns. In unlimited torsion, grasp the bleeding point, and then the proximal portion, without especial care to exclude all of the surrounding tissue in small vessels, and to clear carefully in the larger ones, and give the forceps four to six turns. The entire lumen of the vessel should be occluded, otherwise a portion of the wall only is grasped, and imperfect torsion done, or a portion of the wall is torn off, and in either instance the bleeding continues.

As a result of torsion on vessels the inner and middle coats rupture and an incurvation takes place in the opposite direction of the blood-current and favors the coagulation of the blood, whereas in ligation there is no incurvation, but the inner and middle coats rupture and invert slightly and resemble a V-shaped mass.

The author has used torsion in one hundred and five operations, including thirty-one radical cures for hernias, two explorations of the cranial cavity, eight abdominal sections, eight malignant growths of the breast with axillary dissections, etc.

Tubercular Disease of the Breasts. (*Beiträge zur klinische Chirurgie*, Bd. xiii., Heft 1, 1895.) By Reerink, M.D.

As a sequel to the work done by Maudry (*ibid.*, 1891) the author reports a case of tuberculosis of the mamma that occurred in the Freiburg clinic. The diagnosis was made by histological examination. The etiology of the disease is discussed by the author: he believes that there may be direct infection from without, though this is highly improbable in most cases. There may be extension from surrounding structures, which is probably the more common method, though not in the primary disease, to which class of cases the one under consideration belonged, and to which he had special reference. Where infection from surrounding tissues is excluded, it is probable that the infection can only arise by the hæmatological mode. In cases of localized disease, the author would, after the diagnosis has been made certain, advise an attempt at local extirpation of the diseased area. Where the greater part of the gland is involved he would advise its enucleation and the thorough cleaning out of the axilla.

Rectal Reflexes. (*Matthew's Medical Quarterly*, July, 1895.) By A. B. Cooke, M.D.

The rectum is very abundantly supplied with nerves from the sympathetic system, whose ganglia constitute the chief centres of reflex nerve action. It is also supplied directly from the cerebro-spinal system through the fourth sacral nerve, and the sphincter ani and its contiguous integument receive additional filaments from the pudic, a branch of the sacral plexus. The sphincter ani is the most perfect type of sphincters, and is more richly supplied with nerves than any other muscle in the body. When at rest it is in a state of tonic contraction, and is conspicuous among muscles as being the only one which requires the constant expenditure of nerve force to maintain it in a normal inactive condition. The requisites for reflex acts—an afferent nerve fibre, a transferring centre, an efferent nerve fibre, and a focus of irritation—are furnished in almost ideal form by the rectum and anus, and the reflexes which arise from this locality are the most numerous, the most varied, and the most powerful of which we have any knowledge. The pain which arises from even trivial lesions is out of all proportion to the extent of the disease, and in many cases constitutes the most acute suffering to which humanity is susceptible.

Reflexes are not always pathological evils. They are often invaluable additions to our therapeutic resources. The intimate connection which is maintained between the vital centres and the lower portion of the rectum and its sphincters, through their extensive nerve-supply, is demonstrated at every operation upon these parts. Divulsion, even in profound anæsthesia, unless accomplished with extreme caution and deliberation, invariably produces stertorous respiration, profound modification of heart action, immediate congestion of the cutaneous capillaries, and muscular contraction and rigidity sometimes amounting to opisthotonos. An application of

rectal dilatation to the resuscitation of still-born children has met with complete success in a number of cases. Another field of application for this procedure is its use in the accidents of anæsthesia and narcotic poisoning; asphyxiation and catalepsy form other favorable occasions for its useful exhibition.

The crises in which rectal reflexes have proven themselves effective, and the light and hope which they have incidentally cast upon epilepsy, are sufficient to call for grateful recognition, and inspire a more systematic and exhaustive investigation of the subject.

In a patient, aged twenty-five, operated on for a large mass of hemorrhoids, a fleeting but typical convulsion was noticed during divulsion of the sphincter. A history of "nervous spells" since the age of fourteen and of rectal trouble for six to eight years was obtained, and his physician confirmed the diagnosis of epilepsy. At the time of operation the attacks occurred every two or three weeks. During convalescence there was an excessive amount of pain, and upon moving the bowels on the fifth day an acute attack of mania occurred, which lasted for twelve hours, and was characterized by active delirium and periods of great excitement, accompanied by bursts of laughing, crying, and swearing. The result obtained was perfect, and during the eight months since operating the patient has not had a trace of a "nervous spell."

Four Cases of Accidental Swallowing of the Metallic Tube after the Operation of Intubation. (*Journal de clinique et de thérapeutique infantiles*, May 30, 1895.) By G. Variot, M.D.

One of the great dangers following the operation of intubation consists in the difficulty of fixing the metallic tube introduced into the larynx. It sometimes happens that the child, having loosened the tube by some means or other, swallows it. In France the tubes of Ermold are the ones usually employed; for a child of two years the tube being about four centimetres long and a little over one centimetre in the transverse diameter. While they are, fortunately, composed of an inert substance, may they not mechanically do considerable damage if introduced into the intestinal tract? The author believes that, notwithstanding their large size, the tubes may, if the child lives, traverse the digestive tract without giving rise to much inconvenience, and be found in the fæces. If the child dies from the diphtheria, the tube may be found in various parts of the gastro-intestinal canal, but not in the œsophagus. Of the eight hundred and fifty-seven cases of diphtheria treated by Variot in the wards of the Pavillon Bretonneau, one hundred and twenty-two have been intubated. Since the introduction of the vapor-room, in February of the present year, the number of cases in which it was necessary to practise intubation has diminished. Of the four cases in which the tube was accidentally swallowed, two of the children passed the tube, one in two days (age five years, tube 5.6 centimetres long, greatest diameter 1.1 centimetres), and the other in three days (age six years, tube same size as in

last case), while the other two died from the effects of the disease, the tube being found at the autopsy, one (aged two years) in the stomach, and the other (aged twenty-eight months) in the cæcum. In the first case the child died almost immediately afterwards from suffocation, while in the second case the child survived four days, intubation being again practised, followed by tracheotomy. There was slight reddening of the mucosa at the point of contact of the tube with the cæcum, but no ulceration.

Temporary Resection of the Nasal Bones in Operations on the Frontal, Ethmoidal, and Sphenoidal Sinuses and on the Orbital Cavity. (*Wiener klinische Wochenschrift*, May 23, 1895.) By Professor Gussenbauer.

The author describes in detail two cases of malignant growth of the orbit that extended into the ethmoidal, sphenoidal, and frontal sinuses, and produced deviations in the wall of the opposite orbital cavity.

With both the cosmetic and operative ends in view, he devised the following operative procedure, which, while giving ample room for operation, hides the scar as much as possible.

An incision is made in the soft parts, including the periosteum, through the eyebrows, along the supra-orbital margins, passing down on either side of the nose and uniting by a transverse incision over the juncture of the nasal bones and cartilages. An osseous flap is then formed by chiselling through the nasal bones and cartilages, on the line of incision, through the nasal processes of the frontal bones, the lachrymal bones, and the orbital portion of the frontal bones, and finally dividing the ethmoid bone and its connection through the perpendicular plate with the vomer. On turning back this flap with the soft parts overlying it, the tumor was exposed, occupying the ethmoidal sinuses and extending into the frontal sinuses. After its removal the flap with the resected portion of bone was sutured in place by interrupted sutures, drainage having been established by carrying the packing of iodoform gauze into the nares. The patient made a good recovery and the scar was not easily detected.

In the second case the author modified the operation by carrying a single incision down the median line of the nose, separating the nasal bones from each other, resecting them, and thus turning back two flaps, one on either side. This case also made a good recovery, and the method produces as free a field for operation as the first, but the author believes the cosmetic result is not as good, although primary union was obtained and the scar very small.

A Contribution to the Study of Intestinal Occlusion Subsequent to Laparotomies. (*Gaz. hebdomadaire de Méd. et de Chir.*, No. 11, 1895.) By Dr. Adenot, of Lyons.

For some time past there has been much study of this question, and yet

it remains in many respects an unsolved problem. The study by this author has, however, shown where the trouble lies in many cases, and the method of overcoming them.

After a careful discussion of his own studies and observations in post-mortem examinations this author gives as a *résumé* the following conclusions:

1. A certain number of postoperative intestinal occlusions have as their cause a physiological occlusion of the colon at the left subcostal angle. This impermeability is favored by the fibrous character of the suspensory ligament of that angle. It may be also produced by the pressure of the small intestine upon that angle. The downward displacement of the transverse colon also increases the acuteness of the angle.

2. If the small intestine is placed on a plane posterior to the colon after the operation, there is much less danger of its pressing upon this angle and producing the occlusion.

3. Catheterism of the rectum with Fancher's tube may be successful in some cases in reducing the occlusion, either alone or in connection with gases or fluids injected through it.

4. The introduction of the soft tube is not always possible, on account of its doubling up in the cavity of the rectum. The rectal sound should be used with the greatest care, to avoid injuring the mucous membrane.

5. In laparotomies, the knuckles of small intestines that lie in the neighborhood of this particular angle should be displaced, as their presence there threatens to produce compression.

6. It seems preferable to purge the patient gently on the first or by the third day after operation, and not to wait for an exaggerated meteorism, which is of itself a cause of impermeability of the left colic angle.

7. If an occlusion manifests itself after a laparotomy, the abdomen should be opened again immediately. And, besides the other occlusions examined for, that produced in the left subcostal angle of the colon by the causes mentioned above should not be overlooked.

Tracheotomy in Children. (*Birmingham Medical Review*, March, 1895.) By Leonard Gamgee, F.R.C.S.

Twenty-five tracheotomies on children under twelve years of age are discussed in detail. Of this number, twenty-one were operated on for membranous croup or diphtheria, and eleven were cured. Of eight patients two years of age or under, only one recovered, and this one was suffering from a scald of the larynx. Of sixteen operations on children more than two years of age, thirteen were cured.

Quoting from the statistics of Fischer, of Hanover, the writer says that from January, 1884, to September, 1893, there were admitted into the hospital at Hanover fifteen hundred and ten cases of diphtheria, and upon one thousand of these tracheotomy was performed. In 1885, when there was no epidemic of diphtheria or scarlet fever, there was forty-eight per cent. of recoveries. In 1886 and 1887, when there was a severe epidemic of scarlet

fever, the recoveries fell to twenty-seven per cent. These figures show the dependence of the results of tracheotomy for diphtheria upon the type of the disease, proving an increased mortality when an epidemic of scarlet fever or diphtheria exists at the same time. Two other main conditions influence the result of the operation. They are, the existence or not of pneumonia, and the extent to which the symptoms of asphyxia have been allowed to progress. Sufficient indications for operation are well-marked retraction, both costal and episternal, and the fact that the symptoms are increasing in severity despite efficient medical treatment. In regard to the use of chloroform, when the patient is restless and struggling the operator is aided by anaesthesia and the patient is benefited by the relaxation of laryngeal spasm. On the contrary, when the child is cyanosed, quiet, and semiconscious, chloroform is dangerous, and is not indicated. There are a few points in the treatment to which attention may be called. The general rule is that the thyroid isthmus should be drawn down, the deep cervical fascia should be nicked transversely, and the trachea opened above the isthmus. In a young child with a short, fat neck, the writer never hesitates to completely divide the thyroid isthmus down the centre. As a rule, the bleeding is slight, and the method is more rapid, more easy, and gives a much better exposure of the trachea than the method of pulling down the isthmus. If there is time to wait, the trachea should not be opened till bleeding has ceased. A bivalve silver tube with a movable shield, and of as large size as possible, should be used. The pretracheal fascia should be cut through, and the operator should be careful not to strip it from the trachea, as mediastinal emphysema may take place from entrance of air beneath the pretracheal fascia. After operation the patient should be put in a tent near the fire, without using the steam-kettle. An atmosphere laden with moisture is debilitating, and is rarely of benefit to a patient. A full amount of liquid food should be given by the mouth, unless fluids are returned through the tracheotomy-tube, in which case a nasal tube should be used. At the end of a week, or in some cases before, an attempt should be made to leave out the tube. This should be done gradually, so that the child may become accustomed to breathing through the larynx again. In some cases the tube has to be worn for months, or even permanently. One of the chief obstacles to the restoration of natural respiration is fright, caused by the slight obstruction to respiration when the edges of the wound begin to come together, and which may produce a spasm of the constrictor muscles of the larynx. It is best overcome by using a tube with an opening on its convexity, which may be plugged, at intervals, for some minutes at a time. Granulations may form at the junction of the trachea and larynx. They should be prevented by using a well-fitting tube and by leaving it out as soon as possible. They should be cured by touching them with silver nitrate. Stenosis of the larynx may vary from a partial adhesion of the cords to complete blocking of the larynx from a cicatricial mass. The laryngeal muscles may be temporarily paralyzed by disease, or there may be diphtheritic paralysis, which

is more prone to affect the abductors of the cords than the adductors, and so produce dyspnœa.

The Treatment of Elbow-Joint Fractures in the Position of Acute Flexion, without Splints. (*Boston Medical and Surgical Journal*, July 4, 1895.) By H. L. Smith, M.D.

The term "acute flexion," as used in this paper, means something entirely different from the same expression as employed in the past. It contemplates a flexion of the forearm carried to its limit, and applied to every variety of fracture involving the joint region, save only that of the olecranon process.

Any apparatus which holds the forearm flexed fills every requirement, for as long as acute flexion is maintained, the fragments being moulded into position, the interlocking bones act upon each other mutually as the very best form of splint. A broad ribbon of adhesive plaster is applied as a double figure-of-8 near the wrist, and as high as possible on the arm. The whole arm is then supported loosely in a sling, or is suspended from the neck by means of a bandage fastened to the wrist. By this form of dressing the whole elbow region is left perfectly free from pressure and open for inspection. This method can be employed with safety, as there is no embarrassment to the circulation and no real pain nor discomfort.

The acute flexion is maintained for a period of time varying from three to five or six weeks. The writer believes that good and rapid results are obtained if no motion whatever nor change in position is permitted for at least four and perhaps five or even six weeks.

From the evidence of experimental fractures and the results of clinical experience, the writer believes the following propositions justified:

1. All fractures of the lower end of the humerus, once in position, are held in place if the forearm is kept acutely flexed.
2. Such flexion can be used without danger to the limb or undue distress to the patient.
3. The only force required being one of flexion, no rigid apparatus is needed, it being sufficient to strap the forearm to the arm.
4. The only points to emphasize are: Be sure to replace fragments as flexion is made, taking great care that the internal condyle is as low as possible and the joint not widened by effusion between fragments. If the condyle is kept down, no gunstock deformity can occur.
5. In the cases thus far treated the amount of motion gained has been slightly greater than after ordinary methods. The amount of deformity has been very much less.

NEUROLOGY.

IN CHARGE OF LANDON CARTER GRAY, M.D.,
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AND

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New York City.

Note on Heavy Brains. (*Lancet*, June 15, 1895.) By J. A. Campbell, M.D., F.R.S. (Edin.).

At Garland's Asylum, Carlisle, a post-mortem examination has been made in the case of each death, except two, which has occurred since January 1, 1867, and the weights of the viscera have been uniformly recorded. Of the fifteen brains weighing over sixty ounces, the diagnoses were: Mania, six cases; epileptic mania, two cases; epileptic dementia, three cases; dementia, two cases; general paralysis and melancholia, each one case. The heaviest brain, seventy-one and a half ounces, occurred in a case of epileptic dementia.

Melancholia cured by Intranasal Operation. (*Transactions of the American Laryngological Association*, 1895.) By F. H. Bosworth, M.D.

A man, aged forty-two years, who suffered from depressive melancholia, at first periodic, but later constant, became unfitted for business. He complained of the eyeballs feeling as if too large for the sockets, and of a bursting pain between the eyes. He had at different times been operated on for varicocele, stricture, ligation of the pudic artery, removal of the testicles, and hemorrhoids. He had worn glasses, had his eye-muscles cut, and one eye enucleated. He had been circumcised, had his spine cauterized, and worn a seton in his neck. Examination of the nose showed the right nostril nearly occluded by a thickened bulging of the cartilaginous septum and the left middle turbinate thickened, with myxomatous degeneration, and evidences of ethmoid disease. The nostrils were freed with saw and snare, and all symptoms quickly disappeared. The man has since remained perfectly well.

Structural Changes in Alcoholic Insanity. (*Brain*, winter number, 1895, and *Medical News*, July 13, 1895.) By Lloyd Andriezen, M.D.

The results of the author's investigations are that the neurons showed changes in the cell-bodies and in the nuclei. There were swelling and indistinct staining of the intercellular chromatin rods. There were also coarseness and increased staining of the nucleus, changes that indicate that in alcoholic insanity the cell-protoplasm and cell-nuclei are the seat of serious nutritive disturbances. Especially, however, did Andriezen note alteration and destruction of the fine naked collaterals and nerve terminals of the molecular layers of the cortex,—the very layer in which afferent impressions are first communicated to the nerve-cells of the cortex. There

were also swelling and softening of the very minute protoplasmic granules attached to the special processes in the superficial quarter of the cortex. These changes, "dynamical changes," as Andriezen calls them, doubtless explain the diminished sensitiveness and alertness of the alcoholic to incoming sensory impressions, and similarly a diminution of the spread of the excitation from one area to associated areas. To these changes and to the changes in the cell body are also to be relegated the amnesia of the alcoholic state. We have here the first instance in the history of insanity in which it has been possible to correlate closely cause, structural change, and symptom.

Treatment of Cerebral Syphilis. (*New York Medical Journal*, July 13, 1895.) By L. Steiglitz, M.D.

The author says that unless a special contra-indication exists it is best to combine mercurial inunctions (three to five grains) with the administration of iodide of potassium or sodium in doses of three hundred to four hundred grains a day, which are very well borne by most patients; in fact, the large doses often create less disturbance than small ones, according to my experience. If syphilis of the brain is suspected in a given case and a tentative course of specific treatment is decided upon, the latter must not consist in the administration of small doses of iodide of potassium. Cases of brain syphilis get worse under fifty grains of iodide of potassium a day, but respond promptly to treatment as soon as mercurial inunctions and three hundred grains of iodide of potassium a day are ordered. In such a case, therefore, the tentative treatment should be just as vigorous as though the diagnosis of syphilis were well established; if no improvement at all occurs within four weeks, none is liable to occur from further specific treatment.

Intracranial Neurectomy. (*Medical News*, April 27, 1895.) By R. W. Stewart, M.D., M.R.C.S.

The patient was a woman, aged forty-four years, who suffered from painful tic, which followed an attack of influenza four years previously. The pain was paroxysmal and occasioned by the slightest irritation, such as eating, drinking, talking, a blast of cold air, or the slightest touch. Teeth had been extracted without benefit. The patient was much depressed.

The Gasserian ganglion was reached by Hartley's method. The anterior branch of the middle meningeal artery was accidentally ruptured at two places, but secured by ligatures. The ganglion was broken up by a dental excavator. Recovery from the operation was rapid, and no pain had been experienced six weeks after the operation.

A Fatal Case of Excision of the Gasserian Ganglion. (*Medical Record*, June 29, 1895.) By Arpad G. Gerster, M.D.

The patient was a man who for nine years had suffered from infra-orbital neuralgia. Carnochan's operation had been performed twice with tempo-

rary relief. Dr. Gerster performed Hartley's operation. In liberating the inframaxillary branch of the nerve, suddenly profuse venous hemorrhage was encountered. This was controlled by packing, and three days later the operation was completed. Death followed one week later, and a focus of softening was found at the deepest portion of the wound cavity of the size of an English walnut, involving the cortex. The definition of this focus from the healthy brain was very sharp.

An Atypical Case of Insular Sclerosis. (*New York Medical Journal*, May 25, 1895.) By Theodore Diller, M.D., of Pittsburg.

A male patient, age twenty-one years, had been variously occupied in factories where he was more or less exposed to the fumes of lead, silver, nickel, and mercury. At the age of fifteen a tremor appeared in his hands which was apparent upon emotion or on attempts at fine movements. Four years later tremors appeared in the feet, and now, during emotion, are noticed in the face and tongue. This tremor is coarser than that of paralysis agitans. For the past six months the patient has had a decided tendency to protrude the head forward and to the right in walking. The patient has gradually become emaciated and he has grown weaker. The gait is spastic; both knee-jerks are somewhat exaggerated; ankle clonus is present; speech is halting; the mental processes are slow, and there is apparently some enfeeblement of the intellect. The eyes are somewhat protruded; pupils are dilated; there is slight internal squint; no nystagmus; the vision and the visual fields are abnormal, but there are no gross changes in the fundus of either eye. The case is diagnosed insular sclerosis from the presence of the general weakness and emaciation; the clumsy, shuffling, spastic gait, the exaggerated reflexes, the presence of ankle clonus, the protrusion of the eyeballs, the internal squint, the slight speech affection, and the mental impairment. The nature of the tremor, the age, and the whole attitude of the patient throw out paralytic dementia and paralysis agitans, nor does it seem possible that the disease could be Friedreich's ataxia or Graves's disease. The only affection presenting real difficulties in the way of diagnosis is metallic poisoning. The exhibition of the symptoms, however, would decide against this.

Cerebral Tumor in a Child of Eight Years. (*Medical Age*, May 25, 1895.) By J. Williams, Jr., M.D., of Adrian, Michigan.

A boy, aged eight years, came under observation suffering from strabismus and left-sided motor paralysis. The squint had been present for three weeks, but the paralysis occurred suddenly the day before examination, after a fall. The paralysis was not complete, there being some movement in the arm and in the leg, and the face was not involved. Sensation was normal over the entire body, patellar reflexes and ankle clonus unaffected. The skin had a peculiar, hot, burning feeling. The child was rather precocious, but his words were prolonged and there was a slight deafness in

the left ear. There was no nausea, no vomiting, and no pain, and the muscles did not show the reactions of degeneration. The patient remained in this condition for about eight weeks; on the ninth week vomiting commenced with obstinate constipation and attacks of occipital headache lasting several hours. The urine was always normal. The temperature ranged between 99.5° and 100.4° F. The child died of exhaustion sixteen weeks after the occurrence of the paralysis. Post-mortem examination revealed a small, hard nodule, encapsulated by a tumor of semisolid nature, one and one-half inches in diameter, situated in the substance of the left hemisphere at the beginning of the crus. This growth was surrounded by a yellow, creamy fluid. The cerebro-spinal fluid was increased in amount. There was no tubercular or syphilitic history obtainable.

DERMATOLOGY.

IN CHARGE OF W. A. HARDAWAY, A.M., M.D.,
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ASSISTED BY

C. F. HERSMAN, A.M., M.D.,
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Experiments with Serotherapy in Syphilis.—Gilbert and L. Fournier (*Medical Week*, June 14, 1895) give some account of their experiences with serum in the treatment of syphilis. A review of the earlier work is given. Serum from such animals as dogs, sheep, calves, and rabbits, which are known to be refractory to syphilis, was used. Under this treatment some benefit, such as lessening of the anæmia and cicatrization of syphilitic lesions, was noticed, but the liability to the later effects of the malady was in no way lessened. Pellizzari then used the serum from persons who had entered upon the tertiary period of syphilis, arguing that the toxin contained in their blood might arrest the malady in its earlier stages. That syphilis does produce a substance which is capable of affording a sort of vaccination against the disease is illustrated by the well-known law of Colles and also by the converse proposition announced by Profeta. In spite of these *a priori* arguments Pellizzari's treatment gave disappointing results, for, although the lesions which happened to be present at the time of the injections were benefited, the disease ran its further course unaltered. The failure of this method must be attributed to the fact that there is not sufficient antitoxin in the blood of a syphilitic to assure immunity in the person into whom it is injected.

The authors not only repeated the experiments of Pellizzari, but also endeavored to increase the immunizing quality of serum obtained from animals by previous inoculation of the animals with blood from syphilitics as well as with the chancres and from the papular lesions. In all seventeen

patients were subjected to injections with this serum. Some of these patients had been treated with mercury, and others had had no treatment. The author gives a full account of the result of the treatment in each case. As a whole it may be said that the results were contradictory and wholly inconclusive. In some of the cases improvement was noticed in the general symptoms, in a few the cutaneous rashes disappeared, while in others there was no appreciable effect.

Trichophytic Blepharitis.—Mibelli (*Medical Week*, January 11, 1895) thinks that blepharitis of children is more often due to the trichophyton than is supposed. It clinically very closely resembles the ordinary form of the disease, but is more apt to be confined to the lids of one eye, while it is usually possible to find some hairs broken off at the level of the lid. Often there are patches of ringworm on other parts of the body. A microscopical examination will reveal the true nature of the disease. The treatment recommended is systematic epilation of the diseased hairs, washing the margins of the lids with a two-per-cent. corrosive sublimate solution, and alternate applications of tincture of iodine and the following ointment:

R Sulphur, 10 grains;
Salicylic acid, 6 grains;
Vaseline, 5 drachms. M.

Some Points in the Treatment of Syphilis.—Wickham (*British Journal of Dermatology*, June, 1895) gives some of the more recent views held in France as to the treatment of syphilis. Abadie is a warm partisan of the treatment by the intravenous injection of the preparations of mercury. He uses a one-per-cent. solution of cyanide of mercury. The syringe is made entirely of glass, so that it can be perfectly sterilized. The arm is ligatured about its middle with a handkerchief to make the veins of the forearm swell. The vein is selected and the skin thoroughly sterilized. The syringe, holding one gramme, is completely filled. The needle is passed through a flame and then gently pushed into the vein, being held almost in the direction of the axis of the vessel till it is felt to be in the cavity of the vein. The handkerchief is removed and the piston of the syringe is gently pushed home; an antiseptic dressing is applied. Abadie has made more than four hundred injections without bad results. It is claimed that this method is more energetic than any other manner of giving mercury, and it is free from the objections of the ordinary hypodermic method of administering mercury, such as painful nodes or even abscesses at the sites of puncture. It is the opinion of some of the best syphilographers in France that this method ought to be reserved for exceptional cases, as one can very readily see that it is capable of causing serious accidents.

It is universally admitted that treatment should be begun early in syphilis. The only question is, ought one to begin when a probable diagnosis of chancre can be made, or ought he to wait for unmistakable

evidences of syphilis? The author does not believe that a diagnosis can be made, based on the appearance of the chancre alone. The following points ought to help to confirm the diagnosis at an early period (before the roseola): 1, the peculiarities of the sore; 2, the adenopathy; 3, the chronological history of the sore; 4, confrontation; 5, absence of the strepto-bacillus of Ducrey and Unna, to eliminate the possibility of soft sore; 6, the evolution of the sore watched for a period.

The author sides with Fournier in believing that for the vast majority of cases the treatment continued over long periods and interrupted at times is the best. The other method should be reserved for emergencies or cases of peculiar obstinacy.

OBSTETRICS AND GYNÆCOLOGY.

IN CHARGE OF RICHARD C. NORRIS, M.D.,

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Tetany in Pregnancy. (*Johns Hopkins Hospital Bulletin*, May to June, 1895.) By H. M. Thomas, M.D.

The important features in the case reported are that the disease had lasted twelve years, and bore a most interesting relation to the six pregnancies through which the woman had passed during this time. She was always perfectly well during the first half of pregnancy, but had then daily attacks of tetany, which became more violent and alarming with each succeeding pregnancy. For three or four weeks before confinement she had no attacks, and only once during labor did she have the spasms, but on the ninth day after confinement she had always suffered from a severe attack, except in the case of her last confinement. While nursing her babies she was free (with one exception), but when menstruation reappeared, she was subject to tetany at each period during the cold weather. In April, 1894, when she was comparatively well, there was no difficulty in demonstrating Trousseau's symptom, the facial phenomenon, and a very great increase in the electrical excitability of the nerves.

The circumstances which combine to cause tetany during pregnancy must be extremely rare; the fact that there are not more than twenty cases recorded sufficiently proves this. In looking for a possible explanation, certain experiments made by Dr. William S. Halsted, and as yet unpublished, seem to bear particularly on the subject. He found that dogs always died with symptoms of tetany when both thyroid glands were removed, but that he could keep them alive for an indefinite time without symptoms if he took away the gland piecemeal in several operations. Two of his dogs which were undergoing this procedure became pregnant. The first had lost the left thyroid gland four months previously. For two

days before she gave birth to her pups she had convulsions, and behaved just as did the dogs whose thyroids had been completely extirpated. The left thyroid of the second dog had been removed and one-third of the right three months before she became pregnant. The day before her pups were born she had tremor of the tongue, and general clonic and tonic convulsions. These experiments seem to show that the mutilated thyroids were quite sufficient for ordinary circumstances, but that pregnancy or labor introduced conditions which required additional work which they were unable to perform.

May not the occurrence of tetany in women depend primarily upon some abnormality in the function of the thyroid gland, and the unusual demands made upon this organ in the later months of pregnancy make this a favorable time for the occurrence of the attacks? Gottstein's case, which has just been reported in the *Deutsche Zeitschrift für Nervenheilkunde*, March 15, 1895, is important in this connection. A diagnosis of tetany due to atrophy of the thyroid gland was made. After treatment with thyroid extract a marked improvement was at once noticed.

Cancer of the Uterus removed by the Use of Chloride of Zinc. (*British Gynæcological Journal*, May, 1895.) By F. Bowreman Jessett, F.R.C.S.

At the meeting of the British Gynæcological Society, March 14, 1895, the writer showed a specimen representing a cast of the entire uterus, which he had removed by packing the uterus with chloride-of-zinc paste for extensive carcinoma uteri.

The patient, aged forty-eight years, had a very offensive vaginal discharge for seven months, which finally became more watery and frequently blood-stained. There was a deep ulceration in the cervix which easily admitted two fingers. The growth extended more to the left side.

Under ether the ulcerated parts were scraped with the uterine dredges and Volkmann's spoon, the cavity was packed with wool and freshly-prepared zinc-chloride paste, and the vagina was packed with tampons soaked in bicarbonate of soda solution. On the second day the tampons were removed from the vagina, and it was syringed out daily. On the twenty-fourth day, apparently the whole uterus came away as a slough. The patient soon recovered her health, and now, four months after operation, there is no sign of recurrence.

Intra-Uterine Infection with the Typhoid Bacillus. (*Berliner klinische Wochenschrift*, June 27, 1895.) By H. W. Freund, M.D., and E. Levy, M.D., of Strasburg.

In this case a miscarriage took place in the fifth month of pregnancy, and during the fourth week of an attack of typhoid fever diagnosticated by the temperature curve, dicrotic pulse, swollen spleen, roseola, and loose stools.

Cultures made from the spleen and heart's blood of the fœtus, and from the placental blood, gave numerous colonies of an organism which proved to be the bacillus of typhoid. Cultures made from the outer surface of the placenta and from the vernix caseosa on the fœtus were sterile.

No abnormality was found in the fœtus, except a somewhat enlarged and slightly softened spleen. The intestine was normal. The infecting organism entered the fœtus through the blood, and caused a septicæmia such as has been observed in other cases of intra-uterine transmission of organisms. The characteristic lesions of typhoid may not be found, because the functions of the organs of the fœtus have not been established, just as, for a similar reason, pneumonia is not present in cases of intra-uterine infection with the diplococcus pneumoniæ of Fränkel.

Albuminuric Retinitis of Pregnancy. (*Berliner klinische Wochenschrift*, May 6, 1895.) By P. Silex, M.D.

By an ophthalmoscopic examination the retina is usually found to be cloudy and opaque; the papillary margins are irregular and the papillæ swollen; the veins are dilated and tortuous, the arteries contracted and presenting whitish borders along their walls. In the earliest stages one may see along the vessels and papillæ and in their neighborhood the central arterial reflex, which is transformed into a long, shimmering, golden strand of varying breadth, but always broader than the normal reflex. The retina shows fatty degeneration in the form of white spots that have a star-shaped appearance on the macula, and also larger, round, and striated blood-red flakes. Dark and light red spots indicate involvement of the pigmented epithelium. These changes are often seen in other retinal affections, as in neuro-retinitis of intracranial origin, and in a great number of cases it is difficult to decide whether this condition is due to Bright's disease or to the pregnancy. Hemorrhages may be more frequently found in the retinitis of pregnancy.

The author concludes, from his own observations and from cases cited by others, that the disturbance in sight comes on gradually, in the course of weeks or months, is most frequent in primiparæ, and develops usually in the latter half of pregnancy, at the time that albumin is most frequently found in the urine. The vision becomes lessened, without contraction of the field, and without disturbance of the color sense; sometimes, especially if associated with the eclamptic condition, the sight disappears, then gradually reappears, whether the pregnancy is terminated naturally or artificially. The patients complain of headache, nausea, and vomiting; cedema is present, and the urine is diminished, dark-red in color, and contains a large amount of albumin, with hyaline or very seldom granular cylinders, and much fatty epithelium.

The prognosis in this form of retinitis is better than in Bright's disease or in acute nephritis. According to the investigations of this writer, the restoration of sight seems to depend on the promptness with which the

pregnancy is terminated, whether spontaneously or artificially. In three cases of the twenty-one reported the sight was fully restored. In two patients, who were under treatment during a period of four weeks before the termination of pregnancy, the sight was two-thirds of normal; and, as a rule, if pregnancy is allowed to continue, only partial sight is restored, and sometimes the patient becomes permanently blind. In sixteen cases in which the pregnancy went on to term, or was terminated during the last week, the sight was restored to one-half in six, one-third in two, one-quarter in two, one-fifth in one, one-sixth in one, one-twelfth in two, one-eighth in two, one-hundredth in five. In most cases both eyes are affected equally. Those cases in which the ophthalmoscope shows no changes in the vessels and no alteration in the vessel-reflex are relatively the most favorable; but if the reflex changes are distinctly visible, or the hyaline changes are found in the vessel-walls, then atrophy of the retina and ascending atrophy to the optic nerve must be feared. Relapses of retinitis often occur in later pregnancies, and the prognosis is less favorable at each recurrence.

Streptococcus Infection from Mother to Fœtus. (*Centralb. f. Allg. Path. u. Anat.*, 1895, vi., No. 2.)

Ricker reports a case of a woman, twenty-seven years of age, who died in the sixth month of pregnancy of a disease diagnosticated diphtheria. By careful bacteriological examination the streptococcus pyogenes was the only germ found, and it was also obtained in pure culture from the placenta and from the liver of the fœtus. No lesion was found in the fetus.

The writer recalls a second case, in which the streptococcus was found in the blood of the umbilical veins of a still-born child whose mother died shortly afterwards from the effects of a phlegmon of the arm, which was present at the time of the birth. In neither of these cases was any lesion of the placenta discoverable.—*American Journal of the Medical Sciences*, May, 1895.

PATHOLOGY.

IN CHARGE OF ALLEN J. SMITH, A.M., M.D.,

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HENRY W. CATTELL, A.M., M.D.,

Demonstrator of Morbid Anatomy in the University of Pennsylvania; Prosecutor to the American Anthropometric Society; and Pathologist to the Presbyterian Hospital, the Institution for Feeble-Minded Children at Elwyn, etc.

The Identity of Diphtheria in Man and the Lower Animals. (*Bulletin de l'Académie royale de Médecine de Belgique*, 1895, vol. ix., No. 4.) By Léon Gallez, of Châtelet.

In an interesting and exhaustive work upon this subject, the author

states that the bacteriological proof of the non-identity of the diphtheritic organisms found in man and the lower animals, such as the pigeon, chicken, calf, rabbit, cat, dog, horse, and pig, is not conclusive. On the other hand, the numerous observations of the transmission of the disease from man to the lower animal, nine cases being cited from the literature upon this subject, and *vice versa*, seventy-two observations, are considered by Gallez to be almost positive proof of the identity of the different organisms which have been described in connection with diphtheria in man and the lower animals. Four histories are also given in which the transmission of human diphtheria to an animal has been in return followed by its re-communication to man. While the morphology is different, it is not more so than can be explained by the variations of the Klebs-Löffler bacillus as seen upon different culture media, likewise the symptomatology differs on account of the various anatomical peculiarities of the different species of animals in which the disease occurs. The author considers that we have in animals both an accidental form and an habitual one, the latter being merely a repetition of the culture of successive generations in the individual of the same species, the organism finally taking on special characteristics.

On a Case of Primary Cancer of Bone. (*Glasgow Medical Journal*, May, 1895.) By John Lindsay Steven, M.D., and J. R. McCheyne Miller, M.A., M.B., C.M.

The authors report an autopsy at which were found a tumor of the seventh right rib, an area of consolidation of the right lung, and a bulky tumor of the left ilium. These growths were examined microscopically and were all cancerous in character. The nodule in the lung is considered secondary, and the tumors of the bones the primary formation, for the following reasons: The size of the tumor is much less than is usually the case in cancers of the lung. The tumor was situated on the lateral surface of the lung, an unusual site for primary cancer of the lung. The tumor of the lung was in immediate relationship to the costal tumor, suggesting a direct extension from the rib. The microscope revealed occasionally a close relationship of the cancer elements to the perivascular lymphatic spaces of the pulmonary arteries, suggesting an embolic rather than a primary origination in the lung.

The Micro-Organism of Cancer. (*Lancet*, June 29, 1895.) By James Braithwaite, M.D. (Lond.).

The writer observed the rapid spread of a very superficial epithelioma on the vulvar mucous membrane, and also of a small rodent ulcer on the cheek. In both cases the mode of growth was by invasion of apparently healthy epithelium at the margin of the disease. Reflecting upon these cases and also upon the remarkable discovery made by Mr. Haviland that cancer exists endemically in populations living upon low-lying moist soils and in certain "cancer-houses," the conclusion seemed highly probable that

the disease is caused by a micro-organism, a fungus, and not, as supposed, a bacterium, coccidium, or protozoön. In a large Jewish population in Leeds not one Jewess has been found to have cancer of the genital organs, whereas the disease is extremely common among the Christian women. This observation led to an examination of the secretion frequently contained within the prepuce. Spores and mycelium were found, and this fungus was identical in appearance with one since found in epithelioma taken from the ear, the uterus, the breast, the lip, and the penis, and which could be demonstrated without any difficulty.

The mode of preparation of the tissue to be examined is as follows: Whether the tissue has been in spirit or is quite fresh, cut out from the centre a very small block, except in case of cancer of the lip, when the free margin should be included. Cut thin sections, place in water, float them on slides, and drain off the water. Drop three or four drops of liquor potassæ on each section and let it stand from twenty minutes to four hours, according to its opacity and thickness. When fairly transparent, wash thoroughly in water and mount in Farrant's solution; or if it is desired to examine the section quickly, put a drop of liquor potassæ on it and then adjust the cover-glass. The mycelium comes out gradually more and more distinctly for two hours and then slowly fades. This is due to the fact that the fungus, with its mycelium, spores, and spore-bags, resists the potash longer than the tissues proper. The mycelium will take no dye, and none is required, for its great refracting power makes it stand out clear and distinct in outline. In the breast cancer, which contained live fungus, the greater part of the life cycle could be studied from a section. At first a spore-bag, which consisted of a delicate envelope containing a fused mass of spores, was seen; a rupture of the membrane followed, and from the opening, usually on one side, the mycelium grew and penetrated in every direction. On the next day not a trace of mycelium could be found, but the slide was one mass of spores. In these living spores the process of conjugation could be seen. Two spores in contact become fused into one; three or four or even ten or twenty may become so fused and form a large spore mass.

The life of the fungus seems to consist of four stages: (1) spores, (2) zygosporos, (3) spore masses and spore-bags, and (4) mycelium. A melanotic sarcoma was examined and a fungus found whose mycelium resembled that in the epithelium, but the spore masses contained as many as fifty to two hundred bags, and were egg-shaped instead of round. The spores were of a blackish color. The writer believes this micro-organism to be the cause of cancer, as it was present in every one of the six specimens examined.

FORENSIC MEDICINE.

IN CHARGE OF LORENZO D. BULETTE,
Of the Philadelphia Bar.

WORTHLESSNESS OF MEDICINE EXCUSES REFUSAL OF PATIENT TO SUBMIT TO TREATMENT AND DEFEATS ACTION BY PHYSICIAN TO RECOVER HIS FEE.

WHERE a physician brought an action to recover his fee under a contract with the patient of "no cure no pay," and it was shown that the patient refused to submit to the treatment, the latter may prove that the medicine used was worthless, and in order to do so may compel the physician to testify as to the ingredients of which it was composed.¹

The evidence at the trial showed a special agreement between the parties by which the physician agreed to cure the patient of hemorrhoids for one hundred dollars, "no cure no pay." Further evidence was introduced tending to show that there was a breach of contract on the part of the patient by his refusal, without sufficient excuse, to submit to further treatment from the physician after he had been treated several times; that after the last treatment the physician several times called upon the patient to submit to further treatment, and upon the latter's refusal to do so, brought action to recover the sum alleged to be due, under the contract, for his services.

The physician, when asked what the medicine was which he used as an injection in treating the patient, refused to answer, on the ground that it was his own preparation and discovery. And the trial court sustaining him in this refusal, exception was taken in behalf of the patient, who stated that he expected to prove by other witnesses that the medicine was worthless, and would not have benefited him, even if he had submitted to its use.

The trial court also charged that, "if the jury find that the plaintiff was ready to complete the execution of his part of the contract, and the patient refused to submit himself to treatment by the physician without good excuse, and the latter waited a reasonable time before bringing suit, then he is entitled to recover the amount sued for."

But the Supreme Court, in reversing the judgment entered on a verdict below for the physician, said, "It was perfectly relevant to prove that the

¹ Jones vs. King, 1 S. Rep. 591.

medicine used by the plaintiff was worthless, and possessed no efficacy in producing the results for which it was used. In order to do this, the defendant could prove the ingredients and nature of this medicine. The plaintiff had no property in the secret of his remedy, such as the law would privilege him from disclosing. The fear that such disclosure might give others the benefit of his skill would not excuse him in refusing to testify as to the nature of the medicine. His only mode of protection was by procuring a patent for the discovery. When he became a witness it was for the purpose of testifying to all material and relevant facts within his knowledge not privileged by law from disclosure. The trial court erred in excluding the question having reference to this inquiry."

BOOK REVIEWS.

DISEASES OF THE EAR. A Text-Book for Practitioners and Students of Medicine.

By Edward Bradford Dench, Ph.B., M.D., Professor of Diseases of the Ear in the Bellevue Hospital Medical College; Aural Surgeon to the New York Eye and Ear Infirmary, etc. Pp. 645, 8vo, with 8 colored plates and 152 illustrations in the text. New York: D. Appleton & Co., 1894.

This new text-book is a credit to American otology, and will go far to relieve us of any necessity of commending as best the treatises of foreigners. Written with appreciation of both classic and current literature, and with wise selection of the views, instruments, and illustrations of others, there is yet much that is original in the author's matter and manner,—if only at times in avoiding the usual errors, which constant repetition has made appear authoritative.

The chapter on anatomy is exceptionally accurate, and its illustrations are well chosen, but the half-tone rendering of the author's preparations leaves much detail suggested rather than defined,—falling far short of the corresponding pen-drawings. Those of the adult auditory canal in vertical section, which figure repeatedly throughout the work in excellent elucidation of conditions and procedures, fairly show the relations, but give the canal a length of barely twenty-five millimetres, instead of more than thirty-five millimetres, from the tragus. His black-and-white drum-head pictures are generally far less happy than the colored plates. We miss any illustration of the postnasal image,—perhaps a silent protest against most of the diagrams which do poor service elsewhere; but the verbal description of the tube-mouth hardly conveys any idea of the clinical picture. The very lucid diagram of the topography in relation to operations on the antrum, lateral sinus, and brain is on an unusually small scale, and is open to criticism as showing too high and posterior a point for entering to open the antrum according to his own excellent rules. The middle cerebral fossa is rarely some twelve millimetres high, as shown, the average in a thousand measurements being but six millimetres above the upper margin of the canal, and in one-third of the cases it was less. Leidy's admirable name of "attic" for the epitympanic recess is evidently avoided, while he generally calls the tympanum proper the "atrium;" nor does he follow our American authority in considering the antrum as the posterior part of the tympanum, and not a mere

mastoid cell. Much of the best clinical recent work of which our author is an exponent has crystallized about these names and views of Leidy's, and it seems a pity that they are not universally adopted, in America at least.

The book shows throughout the evidence of scrupulously minute observant work and keen insight into the difficulties which beset the student, as revealed to the active, zealous teacher. Yet much of his advice is over the heads of most of his audience, and will find too few of his colleagues prepared to appreciate it. His views on most points, even those most in conflict with the majority of authors, meet the reviewer's fullest approval, although amidst so much detail there must be points of divergence, such as syringing with "lukewarm water" to remove cerumen, instead of using it as hot as can be borne.

Asepsis is the key-note of much of his teaching, and he accords much potency to bichloride solution (1 to 8000) and little to H_2O_2 , which he uses too dilute. He is very much alive to the occurrence of moulds, while his care in boiling his specula exonerates him from any suspicion of propagating them among his patients. He is quite advanced in his views of surgical intervention, and advocates measures which would hardly be safe in the hands of many of his colleagues, and not at all for "practitioners and students." Much careful detail is given to the subject of intra-tympanic operations, of which the author is a warm but cautious advocate. Few who have published statistics of results have exercised anything like the same discrimination in selecting cases and consideration of every minutest point in operation and after-treatment. His results are accordingly above the average: of twenty-one non-suppurating cases excision, under cocaine, gave much improvement in thirteen, and moderate in seven; and of thirteen, under ether, two were greatly, five much, and five slightly improved. Of forty-two suppurative cases twenty-three were cured, thirteen much improved, and the remainder were lost sight of before the gain was assured. Stacke's operation he thinks little of, and in mastoid operations he destroys all the pneumatic cells, after chiselling off the cortex. The work tempts one to a hundred comments, generally favorable and always respectful; but it will encounter much hostile criticism at the hands of some reviewers. Its typography is worthy of its publishers.

B. A. R.

A MANUAL OF BANDAGING. Adapted for Self-Instruction. By C. Henri Leonard, A.M., M.D., Professor of the Medical and Surgical Diseases of Women and Clinical Gynæcology in the Detroit College of Medicine. With 139 engravings. Sixth edition. Published by the Illustrated Medical Journal Company, of Detroit.

It is sufficient evidence for the need of such a book as this that this treatise on bandaging has reached its sixth edition. There are other books, however, which already completely cover the ground which it was intended that this work should occupy. Dr. Hopkins's "Roller Bandage" is a smaller, cheaper, and better book on this subject, while the work of Dr. G. G. Davis also claims precedence. The illustrations in Dr. Leonard's book are rough specimens, and do not reflect much credit on the printer's art. The illustrations used in recent works on minor surgery, such as that of Dr. H. R. Wharton, are infinitely better, taken as they are from photographs of bandages actually applied on patients.

Taking it all in all, this book has little to recommend it. As a treatise on bandaging it is too long, and as a work on minor surgery it is much too short and incomplete. In practical work it would be difficult to carry out the suggestion of the author when he advises the application of a close-fitting flannel or cotton cap to the head before the application of any bandage. In the chapter on immovable dressings there is little said that would be of any practical use, and no mention at all is made of the ordinary plaster roller, which finds such a wide-spread application

in general surgery. The Watson shears-saw is a combination which would make a most ungainly instrument, and one which, judging from the illustration, it would be most difficult to employ.

J. P. T.

COLECCIÓN DE ARTICULOS DE MEDICINA. Por el Dr. Enrique López. Habana, 1895.

This is a small 8vo of about two hundred and fifty pages, in which the author has gathered together his principal articles already published in different journals and magazines, both professional and non-professional, many of them now enlarged and corrected. We notice that four of the articles were published in English and French medical journals, but Dr. López forgot to give credit to his *confrères* who made the translation for him. Probably the book is merely for gratuitous distribution among the friends of the author.

A. M. F. DE Y.

NOTES ON THE NEWER REMEDIES, THEIR THERAPEUTIC APPLICATIONS, AND MODES OF ADMINISTRATION. By David Cerna, M.D. Second edition. Enlarged and revised, pp. 250. Philadelphia: W. B. Saunders, 1895.

The rapid progress of pharmacology makes it almost impossible for the ordinary, or even the special, practitioner to keep himself thoroughly *au courant* with the newer remedies which chemists and pharmacists place at his disposal. The author states that it has been his endeavor in preparing this "ready-reference *vade-mecum*" to place briefly and succinctly before his readers a description of the chemistry, pharmaceutical and physiological properties, and the therapeutics of all the newer remedies, and, when practicable, of their toxicology. In this new edition the work has been thoroughly revised, many of its articles rewritten, and all the more recent additions to our therapeutic knowledge concerning the newer drugs incorporated. We have examined the book carefully, and consulted it on several occasions. We can commend its accuracy. We regret that all bibliographical references have been omitted. It seems to us that it would enhance the value of the book, and add very little to its volume, to have given references to the more important writings on the several drugs. Notwithstanding, we cordially recommend the work, and are confident that it will fill a recognized want.

A. D. B.

A BOOK OF DETACHABLE DIET LISTS AND A SICK-ROOM DIETARY. Compiled by Jerome B. Thomas, M.D. Philadelphia: W. B. Saunders. Price, \$1.50.

The book affords suitable diet lists for cases of albuminuria, anæmia and debility, constipation, diabetes, diarrhœa, dyspepsia, fevers, gout or uric acid diathesis, obesity, tuberculosis, and general receipts useful in the sick-room. By the use of numbers the above-mentioned terms are avoided in the lists themselves. Their great value consists in affording the doctor a convenient method of prescribing a suitable diet in a manner which is explicit and easily referred to by both physician and patient. The items enumerated embrace a fuller list of articles allowable and forbidden than will occur to one at the moment of consultation. These lists are invaluable for office practice.



DR. MANSON'S MALARIA CHART.

INTERNATIONAL MEDICAL MAGAZINE.

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[No. 8.

ORIGINAL COMMUNICATIONS.

PALUDIC PATHOLOGY.

BY EDWARD BLAKE, M.D.,

London, England.

THERE is so little certainty in medicine that it is quite pleasant to feel that the pathology of marsh fever or ague has now, thanks to the labors of Laveran and other pathologists, been placed on a definite and absolute basis.

Dr. A. Laveran, who was an army surgeon at Algiers, is now professor of medicine in the French school of Val de Grâce. He was the first to observe, in the blood taken from malarious soldiers, pigmented discoid bodies, and also spherical pigmented bodies possessing flagella, whose extremely rapid and varied movements left no doubt as to their nature: this was on the 6th of November, 1880. This observation was published in 1881, in a work printed in Paris, and entitled "De la Nature parasitaire des Accidents de l'Impaludisme."

It is difficult to overestimate the importance of Laveran's brilliant discovery. As with all new truths, its announcement raised, of course, a storm of opposition; but the most coldly critical pathologists now admit that the hæmatozoön of Laveran has been found in all types of acute malarial infection when sought by competent persons, and that it is present in no other disease but paludism,—that is to say, as a necessarily associated condition. The researches of Laveran have also thrown a profoundly interesting light on the method of production of melanæmia, a condition long since recognized as pathognomonic of palustral fever. To that matter we will presently return.

There is very little doubt that the periodicity of ague depends in part on the sudden production, and subsequent liberation in the blood, of the

toxins of this specific sporozoön. In certain forms of paludism, segmentation proceeds rapidly; the subjects of these forms suffer from the tertian and the double tertian forms of ague; whilst the long evolutions lead to a quartan, and the irregular forms are accounted for by different generations of germs, running independent courses, at times parallel but not coincident.

It is scarcely needful to remind the reader that the vegetable kingdom is divided into (1) cellular and (2) vasculo-cellular growths. To the former belong the vast families of the Coccaceæ and of the Bacteriaceæ.

These may be temporarily arranged thus :

COCCACEÆ.....	{ Micrococci (staphylococci of various kinds). Streptococci. Merismopedia. Sarcina.
BACTERIACEÆ	{ Bacilli—sporiferous—as anthrax. Bacteria—non-sporiferous—as typhoid. Spirilla. Vibriones. Clostridia.

All these belong to the *vegetable* world; not so, however, the micro-organism of malaria. *That* is a *protozoön*,—i.e., it belongs to the animal kingdom,—and to this fact may be attributed the value of quinine, which is but a feeble germicide as regards the vegetable forms of life.

The more primitive forms of animal life are subdivided into (1) protozoa, or single-celled organisms, (2) metazoa or enterozoa,—that is, compound-celled organisms.

It is now generally recognized that an enormous number and variety of animal organisms¹ make their home in the human body. Strange to say, many species are less inimical to life than the vegetable parasites. Dysentery, chyluria, and specific hæmaturia have been shown to depend on minute animal organisms either protozoic or metazoic; endemic goitre and the infective carcinomata, both prone to follow the general lines of rivers and marshes, possibly possess a similar etiology.

The stirring events which underlie the phenomenon of periodicity in ague are intensely interesting. Let us take, as an example, the phases in the evolution cycle of the parasite of quartan fever.

First day of apyrexia.—There is a progressive growth of the parasite, with progressive transformation of hæmoglobin into a kind of melanin.

Second day of apyrexia.—The parasite has invaded the greater part of the blood-corpuscle.

Third day.—This is the day of paroxysm. It is understood that the paroxysm begins about mid-day; at this time the blood-pigment collects in the centre of the protozoön, the parasite breaks up, segmentation being

¹ For the most complete account of these, see Davidson's "Diseases of Tropical Climates."

complete, and the toxins of the organism are suddenly liberated in the circulation. They soon reach the nervous system, for which they appear to possess an elective affinity.

These toxins may arrest the downward metabolism of the tissues, leading to a fall of temperature, or they may stimulate the thermogenic centres, which would lead to increase of body heat.

Each individual parasite now becomes eight or more new parasites. These in their turn attach themselves to fresh red corpuscles,—that is to say, if they are fortunate enough to evade the combined attacks of the various forms of leucocytes. In the three succeeding days this “tragedy in three acts” is played once more.

It is stated by the translator of Laveran’s work that, in quite a short time, if quinine be not given, the red corpuscles will fall in number from 4,500,000 per cubic millimetre to 800,000. From this the enormous total loss can readily be conceived.

Quinine is extremely fatal to this parasitic organism, but that it is occasionally fatal to the unfortunate patient, who acts as host, should be borne in mind. Laveran, in writing of the evil effects of quinine, acquits it, however, of causing enlargement of the abdominal viscera: he says that the largest spleens are found in natives who have never taken quinine.

The young physician, blessed with heroic tendencies, should, however, when ordering quinine, bear in mind the following important points. Acute mania has followed a dose of less than twenty grains (grammes 1.25). An asthmatic patient, after forty-five grains taken in one dose, had tinnitus, vertigo, and excessive vomiting. After the lapse of seven hours he was blind, deaf, and delirious. Very small doses have caused facial erythema, orthopnoea, and urticaria. An infant, after a hypodermic injection of thirty centigrammes (about four grains), had scarlatinal eruption, colic, and dysentery. Intense coldness, aphasia, gastro-intestinal hemorrhages, and hæmoglobinuria have also been noted as possible results of cinchonism; the last symptom has been observed many times.

In man, as well as in animals, it is found that quinine rapidly destroys the blood-corpuscles when given in large doses to the healthy.

These are valuable suggestions for the use of quinine in general medicine.

An insane physician destroyed himself by taking two hundred and twenty grammes (three thousand six hundred grains) in ten or twelve days.

A soldier took one hundred and eighty grains of quinine, and in thirty minutes had vomiting, cramp in stomach (tetanus of abdominal recti), pallor, dilated pupils, shallow respiration, shivering, with a small, irregular, and at times imperceptible pulse. He finally succumbed to “syncope,” and Laveran says, somewhat incautiously, that therefore quinine is a cardiac poison! We have here a picture of death such as occurs from diphtheria and similar septic diseases, in which we now know that sepsin destroys life by suspending the inhibitory cardiac control and then by paralyzing the

phrenic. The attack begins and ends with vagal symptoms, yet death comes immediately from the diaphragmatic palsy.

One cannot fail to be struck with the resemblance between the action of quinine and certain other drugs, such as chloral and antipyrin.

Dr. Laveran says that the sulphate is a very wasteful form of quinine: it contains relatively very little of the drug and it is besides very insoluble. The sulphate requires much more water to dissolve it than the hydrochlorate. The neutral hydrochlorate requires only 0.66 of water, and it contains 81.61 parts of quinine in one hundred.

As to the matter of dose, Laveran recommends fifteen grains of the hydrochlorate daily for three days, then four days with no quinine, then two grains daily for three days, then no quinine, and so on.

It is not good to give quinine very late in the evening, as it is apt to produce sleeplessness.

The great battle of the sporozoa with the opposing ranks of phagocytes is waged in the spleen; hence the spleen becomes enormously distended, having in it not only the two armies of occupation but also the materials of war, the sutlers, the commissariat, and afterwards the *débris* of engagements. We can understand too the serious results, under such conditions, of splenic traumatism.

The parasite of palustral blood is seen under rather varied forms, all probably differentiated from a common type. They may be classed under the following four heads:

- | | |
|---|--------------------------|
| 1. Discoid ¹ | } found inside the body. |
| 2. Crescentic | |
| 3. Rose-shaped or segmented | |
| 4. Flagellate: this form has never been seen inside the body. | |

Of these, by far the most common is the disk-like. It was found by Laveran three hundred and eighty-nine times out of four hundred and thirty-two cases of ague.

The detection of the discoid bodies requires no special skill nor aptitude. All that is needful is a high power; a twelfth objective does very well. The chief rules of procedure are—

1. Cleanse cover-glasses in water, then in solution of hydrochloric acid, and finally in ether, then dry over the spirit flame.

2. Let the patient vigorously scrub a finger with hot water and soap and dry it very carefully, and then apply ether, as *the least moisture spoils the preparation* by causing crenation of corpuscles.

3. Ligature the root of the finger, and prick the congested pad with a needle which has been passed through the flame of a spirit lamp.

4. Let the first drop be wiped away with a perfectly clean cloth, and collect the second droplet on the cleansed cover-glass.

¹ Laveran's term for this form is "spherical," which is incorrect: they are not *globular* but *lenticular*.

5. Quickly apply the cover-glass to a perfectly dry and faultlessly clean slide; no cement is necessary.

6. Prepare several such slides, rejecting those in which the corpuscles are heaped up or arranged in rouleaux.

7. It is essential to take a very small quantity of blood, so that there may be only a single layer of flattened corpuscles.

Examine the slides so prepared with a twelfth immersion lens, and in not too bright an illumination. Scrutinize the interior of every corpuscle in the field, looking in them for specks of black pigment surrounded by a pale, hyaline, slightly or markedly amœboid substance; also for smaller, pale, unpigmented, hyaline, and more actively amœboid bodies in the same situation. These are the intracorpuseular and commoner forms of the malaria parasite, and are always present in malarial fevers which have not been treated by quinine. The crescent and flagellated forms and the pigmented leucocytes—although the two former are more rarely encountered, and only in certain cases—are much more easily recognized. If no parasitic form be found in the first field, pass to a second, a third, and so on, devoting at least half an hour to the examination of each slide before pronouncing definitely on the absence of the parasite.

The flagellate form was found by Laveran to be present in ninety-two out of four hundred and thirty-two cases; they are usually very few in number, and naturally, therefore, more difficult to find. As a matter of fact, they occur in all cases; so to detect them is really only a matter of looking often and long enough.

With regard to the flagellate form, the following extremely ingenious suggestions have been made by Dr. Patrick Manson.

1. If the hæmatozoön of marsh fever had no means of migrating from the body of the animal in the blood of which it had taken up its residence, it is obvious that its existence would tend to be limited by the term of life enjoyed by its host.

2. The flagellated body is developed for purposes of change of host. It tends to appear when needed for this purpose, and does not disappear until this has been effected. This body has been recognized only at a definite time after the parasite has been removed from the human body. From this circumstance it may be justly inferred that the flagellated body forms an essential element in the life-history of the parasite. It constitutes a needful phase in its extracorporeal existence. Dr. Manson considers, then, that the spore of the protozoön is endowed with the power of developing flagella for purposes of distribution after leaving its human host.

This is by no means a unique phenomenon in the history of primitive organisms. For example, in many mollusca the young have developed specialized locomotor organs. The embryo mussel (*Glochidium*) can swim by flapping the valves of the exoskeleton. Similarly, whilst the adult oyster is passive, the young is motile.

In the case of the zoöid vorticella, reproduction may take place by the

splitting of the protozoön into eight microgonidia. These microgonidia develop cilia which enable them to swim. This motile embryo settles down and again becomes the passive adult vorticella.

In the distomida the life history of *Distoma hepatica* is as follows:

1. The ovum segments in the oviduct and gives rise to a free embryo. It bears locomotive cilia.

2. This free embryo enters a species of water-snail, losing the locomotive cilia. This is called the "sporocyst" stage.

3. This sporocyst becomes a "redia," which has a long cylindrical body. Posteriorly there are developed two blunt processes, by which the redia can wander through the tissues of the snail.

4. The redia develops daughter rediæ, which resemble tadpoles, the tail being the motile organ. These daughter rediæ make their way out of the snail, lose the tail, become encysted, and are swallowed by a sheep; now the cyst is dissolved by the gastric juice, and an individual redia ascends the bile-duct, becoming, in six weeks, a mature distomum.

Nearly all the trematodes at some stage or other have possessed locomotor organs. The bothriocephalidæ (cestodes) also have ciliated embryos.

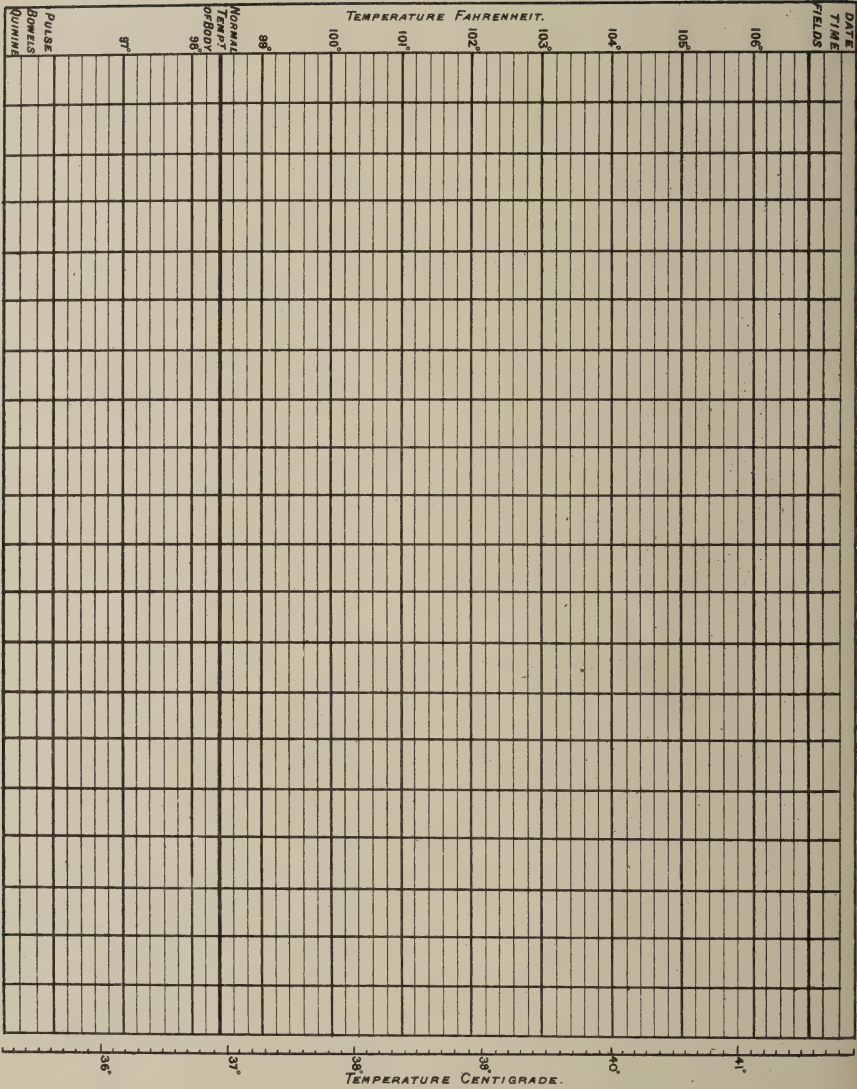
In the minds of those Anglo-Indians who return to live at home, there is a settled conviction that once a man has had "fever" he is ever after subject to a return of it. It is perfectly true that if the victim of jungle fever or ague has had an attack, then in later years any depressing influence may induce recrudescant malaria; though many so-called "relapses" are really some new infection, such as Weil's disease, influenza, and a host of other unclassified specific fevers.

Even if the growth and development of the protozoön be unchecked by germicidal drugs, nature is quite capable in the case of a vigorous and well-fed man of encountering and of destroying the parasite unaided. But it is equally certain that in most cases either the parasite must kill the man or the man must slay the parasite. Such latency as that described by de Brun, of nineteen years, though not impossible is exceedingly rare.

The Italian name *mal'aria*, or tainted atmosphere, is not quite hopelessly wrong, as Laveran's germ may be inhaled; but, as has been supposed with regard to the ovum of bilharzia (*Distomum hæmatobium*), it is also taken into the system with drinking-water. Dr. Manson considers that ague is not a water-borne disease. Its method of convection is probably by means of "fly-dust." The progressive increase of the intervals between attacks of ague is due probably to a growing torpor of the nervous system. Nerve matter becomes callous with toxic tolerance. But when a more normal irritability comes, the influence of catabolic products arrested by shock, or by fresh toxins, as those of influenza, is felt again. If extractives predominate over alkaloids, a rise of temperature takes place, and this is easily mistaken for a reappearance of ague.

It is well known that quinine is occasionally powerless in these relapses, which should be encountered by remedies like arsenic, ceanothus, nux

CHART I.



Dr. Manson's combined Temperature and Malaria Chart.

vomica, sulphurous acid, phosphoric acid, tincture of Ignatius' bean, mercury, and the chalybeates. The selected remedy should be related to the whole pathological group, if possible.

The practitioner should not be too eager to pull down the temperature. Fortunately, as a rule, he cannot do so. It is probable that all the six forms of leucocytes at present recognized are much more active in doing their work of dealing with the enemy when the temperature of the tissues is raised above the normal point. The popular idea that "sharp attacks are soon over" may be seen to have a genuinely scientific basis. Whilst the circulation in the capillaries of the brain and the intestines especially may be embarrassed in certain cases by the mere mechanical effect of masses of protozoa, the nerve symptoms occurring in ague are not the immediate result of the actual presence of the parasite itself; nor, indeed, excepting that it induces melanæmia followed by anæmia, is the parasite in itself the cause of all the great variety of general symptoms found in the course of paludal fever. The symptoms are caused by the toxins which the protozoön produces. This was suggested by Bouchard in 1890, in his very remarkable "*Essai d'une Théorie de l'Infection*," at the Berlin Congress.

There he said, "One thing seems certain to me; it is that the bacteria act on animals by the matters which they secrete;" and, further, "the fever of the infectious diseases is toxic, it is provoked by diastases such as that studied by Roussy, and by ptomaines such as the amidalein of Brieger."

There are grounds for supposing that this view is accurate; it is supported by the observations of Brousse, of Roque, and of Lemoine, who found the urinary toxicity increased during an accession of fever.

Through the courtesy of Dr. Manson and of the editors of the *British Medical Journal* I am able to add greatly to the interest of this paper by reproducing Dr. Manson's charts and his own description of their use.¹

The value of the temperature chart and of similar graphic methods of projecting clinical observations is universally admitted. Such methods greatly facilitate the recording, and still more the comprehension and comparison of the facts in the clinical tableau. The "malaria chart" (see Charts I. and II.) is an attempt to apply the same principle, so far as the nature of the subject will permit, to the recording in cases of malarial fever of the types and varying phases of the malaria organism along with, and in comparison with, the fluctuations of body temperature. The scientific and practical value of such a chart is obvious. It is believed that after a little practice these combined records will be as easily made and read as those of temperature alone, and it is hoped that they will be of assistance in unravelling some of the many difficulties and obscurities at present connected with the malaria question.

¹ A Malaria Chart, by Patrick Manson, M.D., M.R.C.P., LL.D., physician, Seamen's Hospital, Greenwich. See *British Medical Journal* for December 1, 1894, p. 1252.

So far as concerns the figures of the malaria parasite given in the colored frontispiece, Manson lays no claim to originality. These are taken from the works of Laveran, Golgi, Marchiafava, Bignami, and Mannaberg; they were selected as being probably the best illustrations of the malaria parasite that we possess.

In the plate the various forms of the malaria organism have been to a certain extent classified, grouped, and graduated according to their appearances, not necessarily according to their assumed biological relationship. This has been done in such a way that a figure may be easily found corresponding very closely, in type if not in detail, to any parasitic form which may be encountered in blood under examination. Provision by letter and number is made for rapidly and accurately indicating this on the chart, and afterwards of reidentifying it in the plate. These letters and numbers, written in their appropriate place on the temperature chart, constitute the record.

It may be objected to the plate that there is a useless multiplication of certain of the forms of the malaria organism. The compiler thinks, however, that in the present state of our knowledge about this parasite it would have been unwise to leave out unnecessarily, and at the risk of missing what may prove useful even in a small degree, one faithfully drawn figure. Should the observer, as is probable, desire to add to the number of figures, there are several unoccupied spaces which may be used for this purpose.

The figures are classified as follows: Columns A and B contain simple forms of unpigmented intracorpuseular bodies; columns C and D, the ringed forms of intracorpuseular bodies; E and F, principally the pigmented and larger forms of the latter; G and H, pigmented forms of the simple intracorpuseular bodies; I and J, larger forms of the latter, graduated according to size; K and L, intracorpuseular, segmented sporulating forms; M, the latter free and breaking up; N, O, P, Q include the crescent and flagellated forms and the bodies supposed to be connected with these, besides others which cannot be easily classified with the foregoing. The three figures at the foot of column B are somewhat diagrammatic representations of pigmented leucocytes; those at the bottom of D are extracorpuseular forms, the central one, D 11, representing the "swarming" corpuscle; those at the bottom of F represent, according to Laveran, dead forms. L 11, M 8, 9, and 10 represent free forms, perhaps in a degenerated condition; M 11 and 12 are free parasites; and O 11 and 12, degenerated forms.

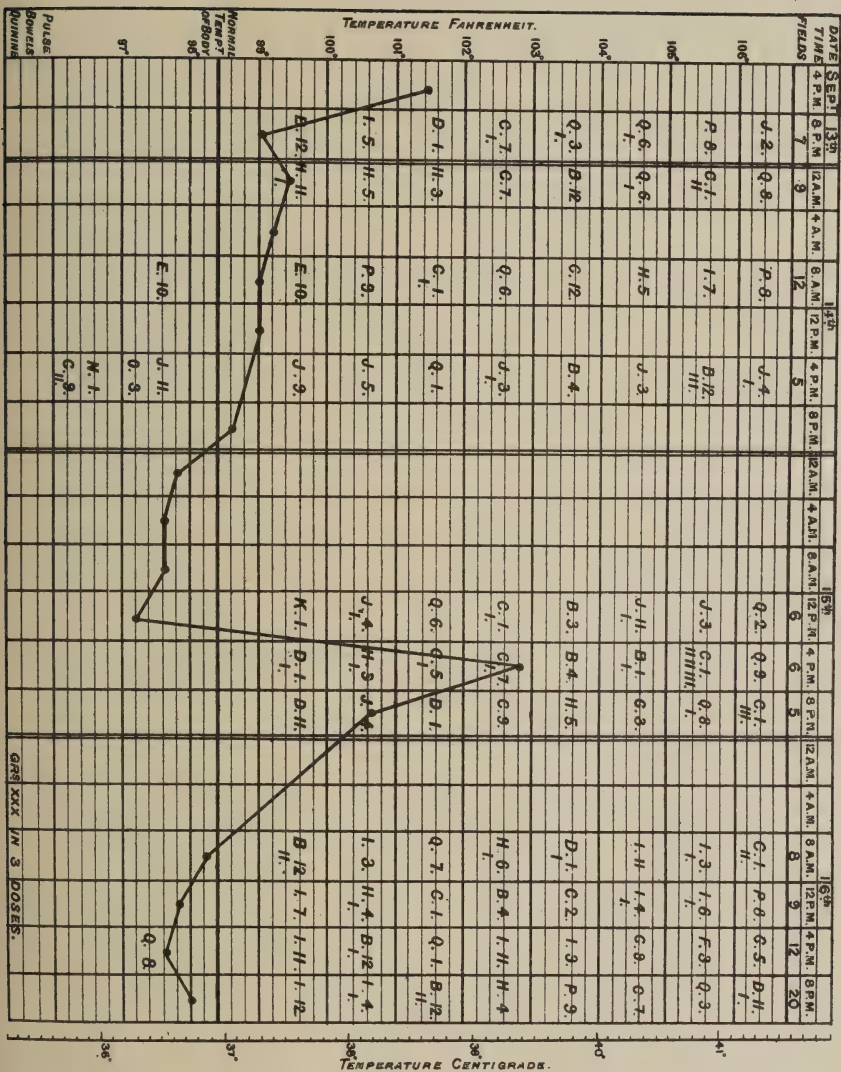
It is not supposed that under ordinary conditions of practice the medical observer could afford the time to make microscopical examinations of the blood every four or six hours, but he may be able, at all events in hospital practice, to make a daily or occasional examination. Such a series of fragmentary and more or less irregular examinations need not be wasted if systematically recorded in the "malaria chart."

Registration of Malaria Organisms.—When a parasite or pigmented

CHART II.

Abt. Aged 40.

TERTIAN AND MALARIAL CACHECTICUS.



Dr. Manson's combined Temperature and Malaria Chart in a case of Paludic Fever.

leucocyte is found, search in the colored plate for a corresponding form, and ascertain the letter and figure indicating the vertical and horizontal lines in which it occurs. Note these on the temperature chart (see Chart II.)—for example, A 1, or B 7, or G 3, etc., as the case may be—in the highest compartment of the column corresponding to the day and hour at which the examination is made. This done, search for a second parasite; a second being found, identify, and note it also, in the same way, in the second space of the same column; and so on until ten or more parasites have been found and recorded. It is important that every parasite found should be noted: there must be no selection of parasites, otherwise the proportion in which the different forms occur will not be accurately represented. A note of the number of fields examined should also be made in the space provided for the purpose at the head of the column.

It is recommended not to register more than fifteen or twenty consecutively-found parasites, as this number is sufficient to convey a fair idea of the proportions in which the prevailing forms occur. It is also recommended that that part of the column which is above the 98.4° line be devoted to the noting of these, space being saved by a tally mark of some sort below the registration of any form which is found two or more times. When an idea of the prevailing forms has been arrived at and the types noted, the observer may proceed to hunt for rarer forms; these might be registered in the spaces below the 98.4° line in the appropriate column.

Temperatures, etc., are to be recorded in the chart in the usual way.

In the absence of the special form of chart the ordinary temperature chart may be used for the registration of parasites.

The charts accompanying the plate are not divided into days, as is usual in temperature charts. This is left for the observer himself to do, so that he can adapt his charts to a four-, six-, or twelve-hour record, as may suit his purpose and convenience.

The object of registering the number of fields examined is to find out approximately the proportion of parasites to corpuscles. This implies that the observer has already ascertained the number of corpuscles which, in properly-prepared slides, an average field of his particular microscope contains, and that in looking for the malaria organism he selects average fields for observation.

Great amoeboid activity of the parasites or other striking and unusual phenomena in connection with them can be indicated on the chart by appropriate signs.

*THE INEBRIETY OF INSANITY FROM A MEDICO-LEGAL
POINT OF VIEW.*

BY T. D. CROTHERS, M.D.,

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INSANITY is a general term used to designate disease of the brain, and includes a great variety of degenerative processes. Inebriety is one of these degenerations, and is often pre-eminent as an insanity, which it not only develops but often masks and conceals. Insanity is a full-developed, organized stage of dissolution. Inebriety is another phase of the same condition, only more obscure and complex. Both are interchangeable and alternating, and both follow fixed lines of degenerative march.

In a certain number of cases the inebriety conceals the real condition, as in general paralysis. Here the drinking habit will appear suddenly, and be explained and justified as a result of certain circumstances, first appearing in moderation, regularly every day, then in excess at night, at intervals, then finally to excess every day. Associated with this is intense egotism and general exhilaration. These cases are often taken to asylums where indulgence in the habit is prohibited, when advanced stages of general paralysis appear. The inebriety is a symptom and also an exciting cause. During this stage of spirit-drinking masked delirium of an elevated nature appears. Changes of conduct and character are common, as shown by the following cases:

A., a miserly, sordid man, began to drink and soon became very generous. He gave away a large amount of property in a strange, unreasoning way, and died suddenly, leaving a will that was contested.

B., after forty years of temperate, exemplary living as a quiet country lawyer, began to use spirits as a food, and warmly defended their value. Soon after he became involved in projects to sell counterfeit money, and later was arrested and sent to prison. When the spirits were withdrawn, general paralysis appeared, and he finally died in prison, the true nature of the case being unrecognized.

C., a manufacturer, a careful, prudent, business man, a total abstainer, of excellent reputation and a leader in the community, began at the death of his wife to use spirits daily. He defended his course rationally and frankly. Later he drank to stupor at night, became reckless in his business, associated with fast women, and committed bigamy. Finally, he was arrested as an accessory to murder by poisoning. General paralysis appeared, and he died in an insane hospital. Twice his family made legal efforts to have his

mental condition examined, but the medical testimony failed to recognize anything beyond his inebriety.

D., a mechanic, previously temperate, began to drink excessively every night. A year later he was arrested for forgery and assault, and two years afterwards he died of general paralysis, in prison.

These cases outline a class whose crimes are strange and unreasonable, persons whose previous character gave no indication of this ending. The use of spirits was strange and unusual, and the changes of conduct and character were overlooked. Delusions of strength and general exhilaration of the mind, with intense activity, frequently appear to the unthinking, not as disease, but rather as evidence of good health, while imprudent acts and altered conduct is considered transitory, and due to spirits alone.

Another class of these cases have more confusing symptoms. They usually begin the use of spirits after some illness, or shock, or injury, and drink excessively, developing delusions of persecution and neglect, with intense suspicions of those nearest to them. Suddenly crime is committed, or strange wills made, or dishonest papers executed. Then comes the question of mental soundness, and the fact of the free use of spirits is accepted as evidence of a voluntary, wilful state, which, legally, is supposed to increase the measure of responsibility. The altered character and conduct, and the unreasonable acts in question, are not studied from a physical side, and the man is placed in prison, perhaps under sentence of execution. Later, muscular tremors, delirium, depression or exaltation come on. If depression, it takes on a religious form, with confessions, repentance, and intense desire to repair the wrong, or to become a light-house of warning to others. Often the confessions are delirious, and consist of extravagant statements based on a few facts and untrue in detail. If the punishment is death, these statements are, in many cases, morbid exaggerations of their own acts and motives in the crimes. If exhilaration follows, bravado and doubts of the execution of the sentence are prominent. Then follow denials of the crime, with indifference and exalted confidence, and satisfaction in the power to overcome the present situation. Both of these states finally merge into paralysis, with dementia and death. If the death penalty follows early in the case, these extreme stages may not appear. If long imprisonment, the record of insanity and death in an insane asylum or prison hospital is common. After trial and sentence, these cases are lost to public interest, but confinement in prison reveals their true condition.

Another class of insanities is preceded by inebriety, and hence concealed and unknown. They are the various forms of progressive degeneration called "dementias." There is a slowly increasing failure of all the intellectual and moral faculties, a dulling and weakening of the mental and emotional activities. This is not idiocy or stupor, but profound or partial failure of the entire organism.

In many of these cases, inebriety is a prominent, early symptom, and crime, law-breaking, and wrongs are not infrequent. There are some dis-

inct forms of dementia that are prominent in legal cases. One class, called senile dementia, is peculiar to old age or to exhaustion in middle life. The following are illustrative cases:

A., a merchant, who at fifty had acquired a fortune, was a model man in his community. Without explanation, he began to use large quantities of wine at night. Later he used stronger spirits, and, although not intoxicated, was constantly under the influence of alcohol. His habits and character changed, and a year later, as president of a bank, he was found guilty of forgery and malefeasance. The defence of inebriety was considered irrational, and two years later he died in prison of dementia.

B, a very exemplary clergyman, began to drink spirits to excess at sixty years of age. He became involved in a social scandal and forgery and was sent to prison for two years. Insanity was urged at the trial as the evident cause of the crime, but this defence was not recognized. Eight months later he died of exhaustion and dementia, in the prison hospital.

These cases are examples of a large class who begin to use spirits to excess in the middle or advanced periods of life. Finally they become involved in some crime, usually of an aggravated character, against property or person. After conviction and confinement the real condition appears.

Another class of these cases is observed in persons from twenty to forty years of age, who suddenly become inebriates, commit crime, and die of dementia. The dementia is due to heredity, or to the premature exhaustion of the brain and nervous system.

A. at twenty-five began to drink to excess, two years later was convicted of manslaughter, and died in prison a year after of dementia. He came from a degenerate family who all died in early life from various exhaustive diseases. He graduated at fifteen as a prize student, and was a brilliant lawyer of great promise at twenty. The inebriety at twenty-five was a symptom of premature age, exhaustion, and dementia.

B., after ten years of intense mental activity in business, became an inebriate and a criminal at the age of twenty-eight. He died in prison at twenty-nine, of dementia. In this case dementia and exhaustion were due to overwork, and inebriety and criminality were only symptoms.

C., at thirty-one years, began to drink and consort with low persons, and later was convicted of bold, unreasoning forgeries. He died in prison of consumption and dementia. In this case, a long period of excessive overwork and mental strain resulted in inebriety, criminality, and death.

In these cases, the decisions of the court were based entirely on the crime, and the fact of inebriety, associated with it, was regarded as an aggravation and evidence of wilfulness.

Many of these cases have marked symptoms of mental change, such as lack of former activity and precision, loss of pride, honor, and ambition; changes in manners and conduct, talk and expressions, these becoming either apathetic or excited. The usual progressive stages of dementia are hurried along in a confused medley of symptoms that become more com-

plex as the palsy from alcohol deepens. But the original cause is seldom concealed, and is always apparent on careful study.

A third class of cases come under legal notice where the inebriety is an initial symptom. They are the slow, progressive, systemized insanities, that after a long initial period develop into some particular form of mania, delirium, and delusion. They are termed insanities of involution, and are literally the progressive tearing down of the brain citadel, and breaking up of the processes of control and adjustment.

Many of these cases become inebriates, and after a variable drinking period abstain, and show symptoms of distinct forms of insanity. Some of these cases have been described as alcoholic insanity, while, in fact, the use of spirits was only a symptom, and not an active cause. The insanity, undoubtedly, comes from some fault of the organism, such as cell and brain starvation, exhaustion, and poisoning.

The derangement of functional activities is manifest in physical pain and suffering, and alcohol is a most fascinating narcotic. Later, the narcotism of spirits becomes painful and repelling and is given up, and the real condition appears. The use of spirits in these cases is not so impulsive or imperative as it is in paresis or dementia, and appears to be more under the control of the will. The pledge, the prayer, the threat, or short punishment in jail, has a deterring power, but only for short, variable intervals. Crimes and law-breaking are common, and seem to start from sudden, dominant ideas that seize and possess the mind to the exclusion of all other considerations. The various manias and phobias describe the dominant thought of the impulse which leads to crime. These mental states are awakened and roused to activity by the action of alcohol. A man, previous to drinking, may have had a thought of the possible unfaithfulness of his wife, or the dishonesty of his friends or associates, or the persecution and jealousy of others, or some special fear or possible disaster in the future from certain causes. Later, when he becomes an inebriate, these morbid thoughts, which were at the beginning hints of brain defects, but were controlled, now become fixed and settled convictions. In the sober moments they may be suppressed and concealed, but when spirits are used, they come into full activity.

Crime in these states may show deliberation, cunning, and premeditation, and even acute reasoning as to the effects and consequences of the act.

A., an inebriate, thirty-four years of age, whose inebriety was of four years' duration, set fire to a rival's store at a time and in circumstances that manifested shrewd cunning and calculation of the effects. Loss of life and of a large amount of property followed. The cunning of the act and his concealment of it were revealed when he became sober. He was sentenced for life, and a year after he became a chronic maniac with delusions of persecutions.

B., whose inebriety was of two years' duration, shot his father-in-law, without apparent motive, and with premeditation and studied reasoning to

conceal his personal identity. He was sentenced to be hung, and before the execution developed mania, and died in an insane asylum a year later. In both of these cases, the act was, no doubt, the development of a thought occurring previously, and restrained for the time ; finally, it became an obsession that dominated every other impulse.

Persons of this class convicted of crime have uncertain conceptions of both the act and the motive which impelled it. Confessions which are minute as to details and reasonings concerning the crime are unreliable, and should never be considered of value as testimony unless sustained by other and confirmatory facts. Delusional confessions and hysterical statements, implicating the prisoner and others, have often been accepted as evidence with great injustice to innocent persons. In a number of instances such confessions have been found to be false ; and inebriates of this class have accused themselves of crimes which they never committed, and have been punished by death in consequence. The same is true of all statements implicating others. When the anæsthetic action of alcohol has passed away, or the man becomes partially sober, a state of bewilderment follows, and his memory of the crime and its motives is hazy and uncertain. At this time, a newspaper account of the act, or the statement of his friends, or some zealous officer of the law, or reporter, may suggest a motive, or range of details of the crime which, after hearing once, he accepts as true without question. The brain in such cases is incapable of forming clear conceptions of acts, or realizing the purpose and motives that predominated.

All such cases should be placed under expert medical observation for a year or more, and no statements of the crime should be used against them, neither should personal confession be considered as evidence except in confirmation of other facts.

Strange, unusual wills, fraudulent contracts and papers, by persons who are recognized as inebriates, should be critically studied, considering first the author and then the act. The first inquiry should be of the onset and history of the drinking period, and the evident changes which have been observed during this time ; then going back to the history anterior to the use of spirits, including heredity, disease and injury, culture, nutrition, and growth. Every fact which has a bearing on the mental and physical health of the man must be noted by this inquiry. If this study is exhaustive the actual condition of the case will appear. The act and its motives, the conditions which preceded it, and the surroundings are all important facts from which to form a correct estimate of the man and the act. Most of these cases show a continuous chain of cause and effect, either from inheritance or disease, marked by changes of conduct and thought before spirits were used, and by decided deviations afterwards.

Where there is a history of sun-stroke or heat-stroke or of an injury causing unconsciousness or a severe fever with delirium appears before spirits are used, followed by inebriety and crime, there is a reasonable expectation of insanity. It may not be of a marked type, and may vary

from the forms described in the text-books, but it will have all the essential elements of insanity.

In a case of bigamy, where inebriety had come on suddenly, and irregularities of conduct followed, I found an extreme state of irritation and wild, strange anger, that was continuous for months before. He had been in jail three months awaiting trial, being deprived of spirits, and nearly all his waking hours were spent in passionate denunciations of others.

A clergyman of quiet, amiable disposition was treated under my care for inebriety, and recovered. Soon after, he displayed a most violent, unreasonable temper in little things, and committed assaults on his wife and family. This became very serious, but fortunately he died before any crime was committed.

Both of these cases were insane, and both manifested extreme changes of temper, that would have led up to crime with absolute certainty.

In another case under my care, the removal of spirits was followed by delusions of death from poisoning by his family. In no other particular did he show mental weakness. This delusion grew to a serious magnitude and became threatening. He made a will, ignoring his family; finally, he was treated with opium, and became an opium inebriate, and his delusion disappeared. His family relations were re-established, and he made a new will before his death, which occurred two years later. The insanity in this case took on the form of delusions, and would have ended in crime had not opium been given. In a similar case, a soldier, who had seen hard service in the late war, was treated in an asylum for inebriety of three years' duration. Soon after, he displayed a violent temper which became marked mania from the most trifling cause. He attempted injury on several occasions and was dangerous in his uncontrolled anger. By accident, he became an opium-taker and his mania subsided. He lived five years after this time, then died of exhaustion and dementia. Melancholy and noted physical depression, with delusions of health, and insane efforts to find some new medicine or means to restore health and perpetuate life, are symptoms in a certain number of cases.

The question in any case which comes into legal notice is the presence of insanity or inebriety. Is the inebriety only a symptom, and insanity the original cause; or is inebriety the cause and insanity the sequel or result? Whichever condition is prominent, alcohol has injured the brain, disturbed and lessened the sensory nerves, and palsied the centres of perception. The brain is enfeebled and unable to act normally because of false impressions, and imperfect power of control.

If the facts of the case indicate some previous change and failure of reason or conduct, and the inebriety is comparatively sudden, it may be considered as a symptom of deeper disturbances. If the inebriety appears after disease, or mental or physical shock, or states of extreme exhaustion, it is clearly a symptom. If inebriety comes on gradually, associated with exhilaration, or unusual depression, grave central brain degenerations are to

be expected. If the inebriety is marked by criminal thoughts and conduct foreign to his previous life, the higher brain centres are breaking down or destroyed. If the inebriety is of three or more years' duration, and has been prominent in frequent intoxications, the insanity is to be inferred, and the possibility of sanity and normal power of reason and control is a fiction unknown in theory or practical experience.

The history and character of the criminal act often give a clear conception of the degenerative brain that executed it. The faults of reasoning and exaggerations and underrating of the results and consequences of acts, with the reckless disregard of the interests of others, are clear evidence of brain failure.

The consideration and final adjustment of these cases and their acts should extend over a sufficiently long period of time to enable the court to be fully acquainted with all the facts at issue.

If, in a case of capital crime, the person should be under medical observation for a year or more, his real condition would appear. If the act of such person becomes a question, the same exhaustive study is essential to reach reasonably accurate conclusions.

HYPERPLASTIC PERSISTENT THYMUS IN EXOPHTHALMIC GOITRE.

BY DR. LUDWIG HEKTOEN,

Chicago, Illinois.

EXOPHTHALMIC goitre has an extensive and interesting literature, the strange clinical manifestations and intricate problems furnishing abundant material for case-reports, studies, reviews, and comprehensive monographs. Even a cursory review of this literature shows that the etiological theories change very radically as the knowledge of the disease and of the organs involved gradually increases. Thus, the early conception that anatomical changes in the central or sympathetic nervous system were the cause of exophthalmic goitre is now no longer in vogue, because it soon became evident that constant, well-defined changes were not found in parts of the nervous system where lesions might possibly cause the varying symptom-complex. Consequently the search for a special lesion in the nervous system has apparently been abandoned, and the many peculiar and erratic changes continually found in individual cases are regarded as secondary, complicating, or accidental conditions.

As it became evident that morbid anatomical changes in the nervous system could not solve the etiological problem, the constant presence of goitre in exophthalmic goitre became more significant. The demonstration that myxedema may follow removal or disease of the thyroid,—its occasional

development in exophthalmic goitre,—that cretinism seems to depend upon aplasia or hypoplasia of the thyroid, showed strongly enough the importance of the normal and the capabilities of the diseased thyroid gland; and at the present time it seems to be the general opinion that exophthalmic goitre must be traced back to a chronic (at times acute) auto-intoxication with substances produced in a diseased thyroid. Maude,¹ in an interesting critical digest of the recent literature, shows the prevalence of the conviction that the complexus of symptoms is caused by some "toxin" from the thyroid which acts upon the vaso-motor centres in the medulla and others in its neighborhood especially, although it may affect even the peripheral nervous structures as well.²

It is quite evident that the complete solution of the question of the etiology of exophthalmic goitre along the lines of these recent theories involves many problems, and chief among them the fundamental one,—namely, the demonstration of the cause of the alleged primary changes in the thyroid gland, to say nothing about the isolation of the toxic substances and further experimentation with them.

In the mean time the changes found in the thyroid and occasionally in other so-called blood glands in exophthalmic goitre will merit study with renewed interest. Thus the hyperplasia of the persistent remnants of the thymus gland, which may perhaps be the case in a relatively large number of the cases of exophthalmic goitre examined *post mortem*, would certainly be an interesting and significant development in connection with the other phenomena of this mysterious disease. And the studies of Boyce and Beadles³ have shown that the hypophysis cerebri may undergo enlargement in myxœdema and in association with changes in the thyroid gland, and although the observations bearing upon this phase of the subject are yet too few to allow any definite deductions, such observations are certainly very suggestive.

The following case is deemed worthy of publication,—first, as an example of fatal exhaustion from uncontrollable vomiting in exophthalmic goitre; secondly, as an additional instance of hyperplastic persistent thymus in this disease; and, thirdly, because the results of the microscopic study of the organs in general may not be altogether without interest even though no new light is thrown upon the cause.

CLINICAL HISTORY.

The following is an extract from the clinical record: Single woman, twenty years old, born in England, came under observation November 29, 1892. Her mother

¹ Brain, summer number, 1894.

² Putnam (Journal of Mental and Nervous Diseases, December, 1893), in an article on thyroidectomy in Graves's disease, discusses this question, and concludes that the "thyroidal cachexia" theory is not proved nor made probable by the facts now at command, but thinks that the thyroid becomes a "centre for the irritation of important nerves" after the irritation of the disease, whatever the cause may be.

³ Report of Department of Pathology of University College, London, 1892-93.

died of "rheumatism of the heart;" one sister died of dropsy, and one of consumption. The mother had a goitre all her life, was nervous, but she never had prominent eyes. The patient has been in Chicago the last two years, and has worked hard at general housework. She began to menstruate at sixteen; the amount has always been very scanty: she would flow only one day or so every six or eight weeks, at which time she would have backache, pelvic colic, and headache. When nine years old she was ten months in bed with some complaint that was called rheumatism, and at this time the legs were much swollen, and also the chest and the stomach. Her personal habits are good.

The present illness has been coming on for about three years, and the first symptom was palpitation of the heart, which has been present during the entire period; at the same time she became more nervous, and during the last eighteen months a gradually-increasing goitre has been present; simultaneously the eyes have become more and more prominent. During the last year there has been considerable pain in the knees, shooting upward to the body; sometimes it has been difficult for her to stand and to walk. There are frequent headaches, occasional vomiting, with pain in the stomach and the sides. Feet become swollen after standing awhile.

Examination (Dr. Knapp).—The patient is well nourished; the complexion florid. She is very excitable and nervous. The eyes are very prominent, and there is drooping of the left lid; ocular motion and vision both good. The thyroid is uniformly enlarged. The heart is tumultuous, but there are no murmurs. The examination of the heart and of the lungs is negative. The tissue over the anterior aspect of the lower third of each leg is swollen, elastic, like myxœdema, and a little tender on pressure.

These symptoms and this condition continued practically without much change for some time. The pulse was seldom below one hundred; was usually 110 to 120. There were frequent spells of vomiting, and on December 17 the nurse notes that she cannot take the temperature on account of the constant vomiting, which continues unabated in spite of medication of all kinds; occasionally the vomitus is streaked with blood; withholding of food and drink has only temporary effect. On December 27 the pulse was above 130, and so continued for three or four days. Some emaciation was now very evident. After January 8, 1893, she retained absolutely nothing in the way of nourishment and stimulants, and the pulse became weaker and faster, the exhaustion more profound, until January 20, when death occurred. During the two last days there was some slight rise of temperature, which until then had been normal all the time.

POST-MORTEM EXAMINATION.

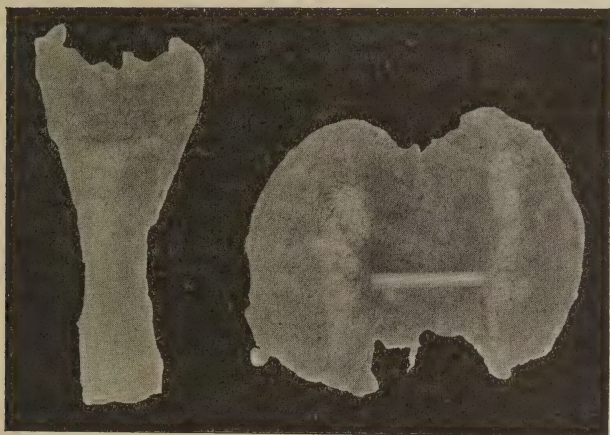
The section was made twenty-four hours after death.

Inspection: The body is five feet six inches long, and the estimated weight one hundred pounds. The rigor is faint, and there is no lividity. The emaciation is marked. Over the centre of the left leg anteriorly is an area of doughy swelling, in which the pitting caused by pressure soon disappears. On section the subcutaneous tissue appears of a light yellow color, and is infiltrated with a homogeneous, semi-solid, mucoid material (myxœdema?).

The peritoneum is smooth, empty, and shining, with a few adhesions about the gall-bladder. There are some adhesions in the right pleural cavity. (Condition of mediastinum described a little further on.) The pericardium is empty. There is a circular area of thickening in the epicardium over the anterior surface of the heart. This area is four centimetres in diameter, and at the periphery are a number of minute extravasations of blood. The heart contains a small amount of goose-fat clot. It weighs two hundred and thirty grammes. The endocardium is not thickened, and the myocardium is firm in consistence, of a brownish-red color. The coronaries are normal. The lungs weigh,—the right three hundred and sixty, the left

two hundred and seventy-five grammes. They are spongy and crepitant throughout; they contain very little blood. The trachea is compressed from side to side,

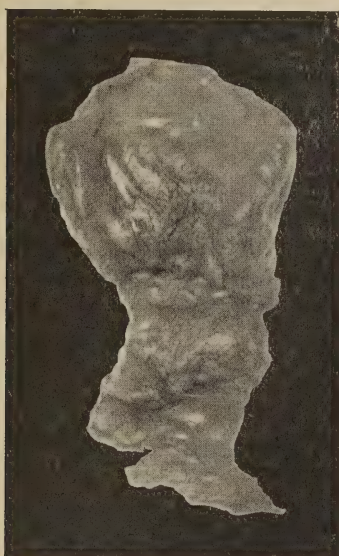
FIG. 1.



Trachea and thyroid, showing lateral compression of trachea by the encircling thyroid, which weighs 100 grammes.

and the cartilages feel soft. The spleen is small, firm, and red; it is anæmic. The kidneys weigh four hundred grammes together. The capsules are firmly adherent

FIG. 2.



Persistent enlarged thymus, posterior surface (natural size).

over some parts of the surface. The tissue is firm and moist, a clear reddish fluid exuding upon the section. The cortex is seven millimetres in thickness; the markings are indistinct. There is a diffuse tinge of yellow in the cortex. The mucous

membrane of the pelves shows a few minute ecchymoses. The uterus and ovaries appear small but healthy. In the liver the periphery of the lobules is quite yellow. This organ contains but little blood. The mucous membrane of the stomach does not show any gross changes; it is stained yellowish-red, and there are numerous small, superficial extravasations and areas of congested vessels. The small and large intestines are not changed. The pancreas appears normal. There are two nodular, calcareous masses as large as walnuts in the root of the mesentery corresponding to the lower end of the ileum. There is nothing unusual about the cranium. The dura is rather firmly adherent to the calvaria. The brain weighs eighteen hundred and ten grammes, and is normal throughout to the naked eye. The spinal canal and the spinal cord also appear normal. The markings on the transverse spinal sections are rather indistinct.

The thyroid encircles the trachea almost completely; it consists of two lateral concavo-convex masses united in front by means of a narrow isthmus. It weighs one hundred grammes, is firm in consistence, and uniformly fibrous on section. The trachea is compressed from side to side, and the cartilages feel softer than normal (Fig. 1).

In the interior mediastinum there was noticed at the beginning of the section a pinkish soft mass that reminded one of the thymus gland (Fig. 2). Careful dissection showed this mass to extend from the lower border of the thyroid to the middle of the pericardium. It is thicker above than below; at the thickest it measures six millimetres; after removal there is presented a mass, weighing sixty grammes; the measurements are six millimetres in greatest thickness, nine centimetres in vertical and six centimetres in horizontal diameter. It is soft, pinkish gray on section, and was only loosely connected with the surroundings.

The hypophysis cerebri fills the cella turcica completely; it seems normal to the naked eye. Unfortunately, it was not weighed.

The optic nerves, the eye-grounds, and the orbits are also normal, and the cervical sympathetic nerves and ganglia and the tenth nerve show no gross changes.

MICROSCOPIC EXAMINATION.

The pons and medulla, the spinal cord, the vagi as they run in the neck, the phrenic nerves, the cervical sympathetic ganglia and part of the nerves passing between them were hardened in Müller's fluid. Pieces of all the other organs, except the genital, the adrenals, and the large and small intestines, were hardened partly in Müller's fluid and partly in alcohol.

Unfortunately the spinal cord became mixed with other cords, and consequently the examination was omitted because of the doubtful identification.

Medulla and Tenth Nerve.—The medulla and a piece of one vagus nerve were kindly examined by Dr. A. Meyer, pathologist to Kankakee Insane Hospital, and the following is an extract from his report: The slides prepared with nuclear stains show nothing abnormal. Sections through the region of the vagus nucleus, prepared according to methods of Weigert and Pal, and in some instances also treated with carmine, do not show any lesions. A somewhat peculiar focus in the ascending root of the fifth nerve is similar to what can be found in any series of sections through the normal human medulla. The preparations of the tenth nerve (Pal) do not show anything certainly pathologic; it is likeliest that the partial staining observed is merely accidental, due to some irregularity in the preservation. Unfortunately there are no normal nerves from the same body at hand for comparison as regards the quantity of myeline in the vagus; at any rate, there are no abnormalities in the hæmatoxylin preparations. The latter is also true of specimens prepared by the writer by various methods, and applies to the phrenics as well. Personal examination of Dr. Meyer's specimens leads to the same conclusions as his. There are no changes in the restiform bodies.

Cervical Sympathetic Ganglia.—In sections stained with methyl blue and with eosin and hæmatoxylin, the protoplasm seems somewhat shrunken, so that there is usually a narrow space between the cell-body and the connective-tissue capsule; the cells seem of normal size, the nuclei stain distinctly and seem large, and many of the cells contain rather coarse granules of yellowish or unstained and colorless, amorphous, but sometimes glistening, pigment, which is often found at one pole of the cell; sometimes the pigment masses seem to occupy as much as one-half of the ganglion cell's body. The other parts of the ganglia do not appear to present any abnormalities whatsoever.

Kidneys.—The cells lining the tubules in the labyrinthine part of the cortex are in general granular and fatty, so that the outlines are indistinct and the nuclei frequently not demonstrable; in some places the tubular lumen is filled with a granular and fatty detritus, in other places it is nearly or quite empty, and again in others it is collapsed. The walls of the tubules do not appear to be much thickened except in very occasional instances, and there is no intertubular cell infiltration. The blood-vessels occasionally have thickened walls; they are usually filled with blood, and there are also a few small hemorrhagic foci in the cortex. There are no marked changes in the glomeruli; the capsule appears thickened in some of them, and the capillary tuft larger than normal. Finally, there are scattered islands of sclerotic tissue in which the glomeruli are replaced by concentric nodules of hyaline material.

Liver.—There is marked fatty infiltration in the periphery of the lobules which gradually disappears in the direction of the centres.

Stomach.—In the mucous coat all cellular structure is lost, and upon the muscularis mucosæ is found a granular layer in which are some nuclei; but there is no indication of any distinct tubular arrangement in any of the sections which came from the greater curvature towards the cardiac end. Presumably this destruction of the mucous membrane occurred *post mortem*. The other coats appear normal.

Heart and Lungs.—No changes were found, but the examination was not extensive.

Hypophysis.—The appearances do not in any respect deviate from those of sections from the pituitary bodies of persons of about the same age that died from other causes than exophthalmic goitre, and the sections from this case might well have served for the purpose of preparing the drawings found in text-books of normal histology. The majority of the tubules are closed, and the intertubular connective tissue is very vascular indeed.

Thyroid Gland.—The stroma has increased in greater proportion than the glandular part, although it is evident that, in view of the size of the gland and in view of the amount of gland parenchyma, the latter must also have undergone proliferation. The stroma is richly cellular, and its appearance much like that of granulation tissue of some standing; the vessels are not abnormally large or numerous, and the sections in some places seem even less vascular than usual.

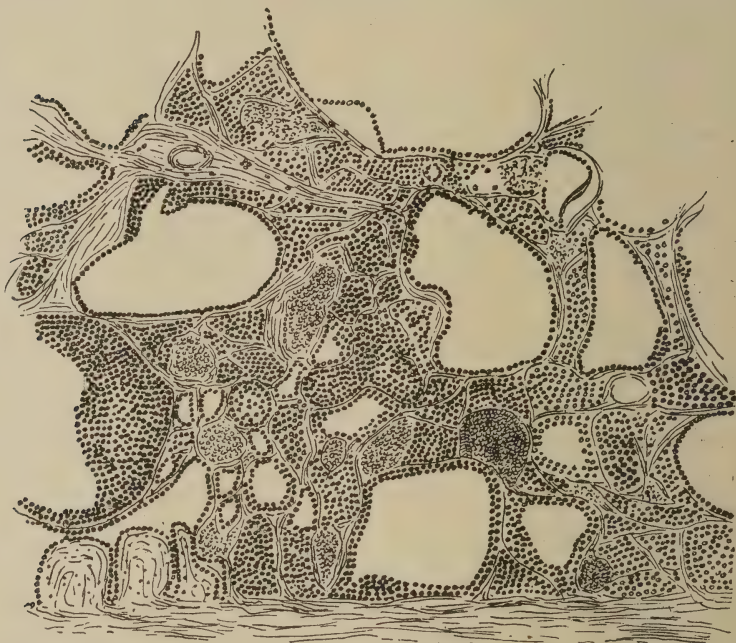
The tubules vary in size and in shape. In most instances the cell-lining is well preserved, the cells being rather granular and the nuclei perhaps somewhat indistinct. In shape the cells are usually more oval than cuboidal. There are no cylindrical cells present. In many tubules the cell-lining is composed of more than one layer, but without any regular arrangement in superimposed layers, the lining at one place containing more cells in layers than at others. The tubular lumen is of varying size, frequently distinctly enlarged, quite often fusiform or saccular in shape, and, as a rule, empty (Van Gieson's hæmatoxylin and acid fuchsin method), only a very few follicles containing any colloid material. The cells in the masses and nests produced by cutting the tubules in a tangential direction do not differ in any essential from those lining transversely cut tubules.

Some atrophic tubules are undoubtedly present, because in some (though few) the cells are not so large as usual, but short and indistinct in outline and occasionally

simply a granular protoplasmic ring lines the tubular lumen. Then there are found small groups of irregular cells, or remnants of cells, that impress one as the final stages of tubules in the process of obliteration; there is, however, no marked condensation or fibrous thickening in the tissue about these remains, neither are there any concentric nodules of fibrous tissue observed in the sections.

Thymus (Fig. 3).—The sections present the same appearance as that of an active thymus of a very young person. The division into lobular spaces by means of a delicately fibrillated connective tissue seems well marked; the spaces thus provided

FIG. 3.



Section from thymus, showing lobules partly or wholly filled with small round cells with deeply stained nuclei. The vessels are filled with blood, as a rule. Camera lucida drawing of section hardened in Müller's fluid and stained in gentian violet.

are usually quite well filled with round, deeply-stained cells, the central part being frequently empty; but from the irregular distribution of the cells along the periphery of the partly-filled spaces, it would seem that perhaps many cells had fallen out during the process of preparation. In the smaller lobules the cells are usually present side by side throughout their whole extent. In some places the amount of interlobular tissue is so slight that it seems as though a diffuse infiltration of cells had taken place; but usually a lobular arrangement can be demonstrated. The vessels are numerous and filled with blood.

The lymphoid cells in the lobules are noteworthy on account of their round, large, deeply-stained nuclei, whose richness in chromatin is shown by their affinity for the nuclear stains. Karyomitotic figures were not obtained, and most likely this was due to post-mortem changes. There is no intercellular substance demonstrable.

It is, finally, also worthy of note that not a single concentric Hassal's body was found.

There were no inflammatory changes in the interstitial tissue, which consists of fibrillated fibrous tissue without any development of fat (except at the very periphery of the organ).

In sections stained with the Van Gieson method (hæmatoxylin and acid fuchsin) for the purpose of showing the absence or presence of any peculiar colloid-like substance, no additional features were developed other than have been described.

This case is marked by several peculiar features. Among these may be mentioned the continuous, exhaustive vomiting; the changes found in the gastric mucous membrane are such as may be due to post-mortem softening, and most likely the vomiting did not depend on local conditions in the stomach. How far the kidney changes were responsible for the vomiting, if at all, remains, of course, a matter of conjecture. The likeliest explanation would seem to be that the vomiting depended on an involvement of certain parts of the nervous system in connection with the many other nervous disturbances, all being due to a common though unknown cause. Under all circumstances fatal exhaustion due to uncontrollable vomiting in exophthalmic goitre belongs to the unusual and remarkable.

The presence of a doubtful myxœdematous area in the subcutaneous tissue over the anterior surface of the left leg recalls the occasional development of myxœdema in exophthalmic goitre,¹ which must be looked upon as very strong evidence of the serious changes in the structure and function of the thyroid in this disease.

There now remains to consider very briefly the changes in the thyroid and then the enlarged thymus.

As would be expected, the strumous changes in exophthalmic goitre are not such in kind as to allow any deduction as to their cause; nor do they present constant peculiarities that would stamp them as specific and characteristic lesions, found only in this disease. Nevertheless there seem to be no very great variations in the results obtained by the recent writers who have studied the thyroid, and among them may be mentioned Joffroy and Achard,² who in five cases found the essential lesion to be dilatation of the vesicles in one, disappearance of the colloid material and proliferation of the epithelial lining in three, and typical adenoma with fibroid changes in the trabeculæ in one. Hezel³ found proliferation of the cells in many vesicles, the cells changing from cubical to columnar in shape. Greenfield⁴ describes essentially the same changes, which he terms catarrhal proliferation, and finds also disappearance of the colloid material. Raymond⁵ also describes hyperplastic changes in the gland follicles, and Müller⁶ finds similar changes in four cases. Buxhan in his laureate monograph⁷ summarizes the anatomic changes in the thyroid in the following words: The changes

¹ Maude, loc. cit.

² Arch. de méd. exp. et d'anat. path., No. 6, November, 1893.

³ Deutsche Zeitschrift für Nervenheilkunde, iv. 353.

⁴ Bradshaw Lectures, 1894.

⁵ Bull. de la Soc. Anatomique de Paris.

⁶ Deutsche Arch. f. klin. Med., 1893, p. 335.

⁷ Die Basedow'sche Krankheit, 1894.

vary from simple hyperplasia and dilatation to colloid and cystic degeneration with induration. Grainger Stewart and Gibson¹ mention three cases, in all of which the changes were identical, "consisting of glandular hyperplasia with catarrhal² changes in some of the acini, which were more numerous and smaller than usual and were separated by a delicate connective-tissue stroma. The colloid material had almost entirely disappeared, and there was an interstitial change attended with much cellular proliferation spreading inward from the capsule."

In our case the thyroid was much enlarged, weighing one hundred grammes, and this was due to hyperplastic changes in both the interstitial and the glandular tissue, the former predominating considerably, and in some places the gland follicles seemed atrophic. Proliferation of the epithelial lining of the follicles was marked, the cells being round rather than cuboidal; colloid material was absent from the majority of the follicles, many of which were slightly dilated.

From this brief consideration it appears that the changes commonly observed in the thyroid in exophthalmic goitre are: Proliferation of the follicular lining, disappearance of the colloid material, and interstitial hyperplasia. Manifestly such changes may in their progression result in appearances which might vary greatly from those of earlier stages.

The presence in our case of an enlarged persistent thymus³ recalls the comparative frequency of thymic hyperplasia in exophthalmic goitre. The following instances of persistent thymus in exophthalmic goitre are probably all of such cases to be found in readily accessible sources:

Mosler⁴ found the thymus considerably enlarged, and in a state of simple hyperplasia, in a twenty-year-old woman who died from pneumonia during exophthalmic goitre.

Lasvenes⁵ found remnants of the thymus in a sixty-three-year-old man.

Johnstone⁶ describes a large thymus from a thirty-two-year-old woman; it measured $3\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{2}$ inches, was triangular, and reached from the lower border of the thyroid to the large vessels.

Spencer⁷ found a "remarkably large thymus" in a twenty-year-old woman; it was adherent to the thyroid and as large as the head of the pancreas.

White⁸ found the thymus present in a woman thirty-one years old, and also⁹ a four-inch long thymus in a woman twenty-one years old.

¹ British Medical Journal, 1893, ii.

² This use of "catarrhal" (Greenfield, Maude, loc. cit.) is certainly new.

³ According to Waldeyer the thymus always persists in the form of very minute remnants, hence the term hyperplastic or enlarged persistent thymus would seem to quite correctly describe the conditions in most of the cases referred to.

⁴ Krankengeschichten, 2 Folge, Greifswald, 1889.

⁵ Thèse de Paris, 1891.

⁶ Journal of Mental Science, 1884, p. 521.

⁷ Trans. Lond. Path. Soc., 1891.

⁸ British Med. Journal, 1880.

⁹ Ibid., 1886.

Möbius¹ found distinct remnants in a fifty-one-year-old woman.

Reymond² describes a case of acute (fourteen days), fatal exophthalmic goitre in a forty-five-year-old woman, in whom the thymus was present.

Koppen³ mentions that he found "a very large thymus" in a woman twenty-three years old, with osteomalacia and exophthalmic goitre.

Buschan⁴ mentions that Clarke⁵ and Hilton Fagge⁶ describe similar cases, but the original descriptions have not been reached.

Marie⁷ has had six cases of exophthalmic goitre with persistent thymus.

On account of the indefinite descriptions of some of these cases it is impossible to say whether all are instances of real enlargement of the persistent thymus remnants or not. Perhaps some are simply the retrosternal fat body that Waldeyer,⁸ Orth,⁹ and others show may maintain the form of the thymus after the thymic tissue proper has undergone the nearly complete physiologic, lipomatous atrophy, but in the majority the conditions described point to a real hyperplasia of the thymic remnants.

As regards the thymus in our case, it can be said that its size, weight, and especially its histologic structure point to a hyperplastic organ in active performance of its functions, because its cells are all rich in chromatin, there is no fat in the fibrous tissue between the lobules, and there are no concentric Hassal's bodies present which appear when the physiologic metamorphosis into fat commences.

The majority of the writers above mentioned content themselves with simply referring to the presence of a thymus, but Marie¹⁰ regards this condition as a "vicarious" redevelopment from the involutionary atrophy in which it exists in adults, and speaks of the "revivescence" of the thymus not only in Basedow's disease, but also in acromegaly and in myxœdematous idiocy. In the latter condition Bourneville found the thymus enlarged. In acromegaly Marie¹¹ himself describes persistence of the thymus as one of the principal changes.¹²

There is no anatomic reason against this idea of Marie that the thymus may undergo a vicarious hyperplasia in diseases in the thyroid and in the

¹ Quoted in Schmidt's *Jahrbücher*, B. 193, p. 25.

² *Bull. de Soc. anat. de Paris*, sér. 5, vol. vii., No. 18.

³ *Neurolog. Centralblatt*, 1892, No. 19.

⁴ *Basedow'sche Krankheit*, 1894.

⁵ *Bristol Med. Journal*, 1887, No. 15.

⁶ *Medicine*, i. 1012.

⁷ *Gazette des hôpitaux*, February 21, 1893.

⁸ *Sitzungsbericht der K. Preus. Acad. d. Wissensch. zu Berlin*, xxiii.-xxv. 993.

⁹ *Lehrbuch der path. Anat.*, 1887, p. 88.

¹⁰ *Loc. cit.* See also discussion of Johnsen's paper on exophthalmic goitre in *Trans. Ill. State Med. Society*, 1893.

¹¹ *Virchow and Hirsch, Jahresbericht, etc.*, 1889, ii. 133.

¹² Squance, *British Med. Journal*, 1893, No. 1714, p. 993, details a case of acromegaly with persistent thymus and hypertrophy of the left lobe, the weight being one ounce, the color pink, and the consistence pulpy.

hypophysis, because the thymus does not completely atrophy, but, as shown by Waldeyer,¹ small islands of thymic tissue persist in the retrosternal fat body mentioned as replacing the gland, from which the thymus could again develop under certain conditions.

In conclusion it may be said, although exact figures are not at hand, yet the statement will probably not be doubted, that as compared with the total from all sources the number of instances of hyperplastic persistent thymus in exophthalmic goitre is proportionately larger than can be explained without assuming some closer relation between the disease and the enlarged thymus than an accidental coincidence.

OPERATIVE TREATMENT OF PROSTATIC OBSTRUCTION.

BY LEWIS L. MCARTHUR, M.D.,

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DEFINING prostatic obstruction as the dysuria incident to narrowing of the urethra from changes in the shape, size, or structure of the prostate (whether from senile sclerosis, inflammation, or neoplasms), and emphasizing the fact that this paper deals solely with the above condition when the symptoms have failed of relief by purely medical and local remedies, let us see what procedures still offer substantial hope of aid.

Thirty-three per cent. of all men past middle life possess hypertrophied prostates; of that number one-half experience no trouble; the remainder have some urinary difficulty; and of these ten per cent. have some pathological lesion. (American Text-Book.) In atony of the bladder, which ensues in a fair proportion of prostatitis, removal of the prostatic enlargement will not cure the case; the pressure on the urethra may be from enlargement of any one or all of the prostatic lobes, and when from the middle alone or from the annular thickening of Brodie at the internal meatus, it cannot be felt per anum. When due to neoplasms, it cannot always be determined by a rectal examination.

At various times, by different authors, the following plans of treatment have been more or less strongly advocated: 1, electrolysis; 2, cauterization (actual or galvanic); 3, castration; 4, prostatectomy (partial or complete); 5, drainage (perineal or suprapubic); 6, ligation of the vas deferens and interference with the blood supply.

We will dismiss at once as unscientific electrolysis of the prostate, either as recommended by Caspar, of Berlin, Nélaton, or Althaus, who introduces the platinum needle through the rectal wall directly into the lobes of the gland, and, using a large external electrode with from ten to twenty-five

¹ Loc. cit.

milliampères for five minutes, partially withdraws the point, then, inserting it in another direction, repeats the procedure for a similar length of time. The latter gives four cases with no cures, one recto-vesical fistula, one improvement, one unimproved. Newman and Bottini recommend the intra-urethral use of the galvano-cautery. This is pushed down until prostatic resistance is felt, when the current is turned on and the obstruction burned away. Belfield, in a similar manner, operates through a perineal wound.

The suggestion to remove the testicles for the purpose of producing an atrophy in the prostate similar to that induced by a removal of the ovaries has not, for various reasons, been well received, though such atrophy has been observed. Harrison has recommended drainage through the perineum, by puncture with a trocar plunged directly through the perineum, one-half inch in front of the anal orifice, and the introduction of a permanent drainage through the same canula. It remains for us to decide, then, between prostatectomy and drainage.

Whatever operative procedure we institute, it should be with the object of affording the greatest relief with the least risk to life. A better illustration of the influence of years of habit, based on good clinical experience, could not be afforded than the fact that the older surgical minds still cling to the perineal route in preference to the suprapubic. For the past two centuries (prior to antiseptic days) rude experience had taught the genito-urinary surgeon that best results were obtained through a perineal route, and that surgical interference by any other was to be dearly paid for. With the new conditions obtaining, because of a more accurate knowledge of the causes of wound inflammation, of better methods of avoiding the same, and of better technique, we still feel so strongly the influence of this older teaching that many refuse to yield to new proofs, daily accumulating, that former experiences do not of necessity repeat themselves when former conditions no longer obtain. To illustrate the trend of opinion of our representative American surgeons, G. Wylie Broome, of St. Louis, in an excellent monograph on this subject, in which he urges the permanent suprapubic drainage, quotes from the American Text-Book,—viz., “The results of experience thus far seem to show that the operation of prostatectomy is justifiable in most cases of hypertrophied prostate in which catheterism is difficult, or impossible, or excessively painful, and in which a high grade of cystitis has developed, and septicæmia or uræmia is imminent. The prognosis is unfavorable in proportion to the duration of the obstructive symptoms and the size of the mass which it is necessary to remove to secure patency of the urethra, and is of course much influenced by the condition of the kidneys.”

Now, while this quotation does serve to illustrate the sentiment of this group of eminent surgeons, to which both he and I take exception, his next statement is incorrect, and worthy here of correction. He says, “No other treatment is recommended than that of prostatectomy, save that of systematic catheterism, and that only as long as it can be endured by the

patient." For on the same leaf from which he quotes is the following: "Treatment may still continue to be palliative, and may consist in opening the bladder through the perineum, by means of the operation for median lithotomy. . . . Occasionally it will seem wise to make drainage by means of a suprapubic puncture. Hunter McGuire has shown that it is possible to do this by establishing a small permanent fistulous opening running obliquely upward, and to retain considerable power over the urine. The suprapubic incision has the advantage also of permitting, better than the perineal, the thorough exploration of the bladder and prostate, and, if necessary, the employment of more radical measures."

While thus "damning with faint praise" the very method which Broome so ably presents in his brochure, and which operation I am here to advocate, it is not fitting to misquote them.

I have for over six years been in the habit of urging the more frequent use of the suprapubic incision for the treatment of the various vesical troubles to which it is so admirably adapted, and to-day I am still more convinced that this plan, above all others, offers the safest, easiest, and most rational means of relieving the victim of prostatic obstruction, while at the same time serving to clear up, as can in no other way be accomplished, the exact pathology and indications in the given case.

What are the indications in the given case? To give prompt, safe, and permanent rest to an inflamed bladder. How may it be accomplished? In one of two ways,—either by removing the obstruction, or in some way getting round it. When the lumen of the œsophagus becomes so obstructed with a growth that the danger of its removal is out of all proportion to that of making a gastric fistula in two stages, the choice of a gastrostomy is unanimously made; when a narrowing of the intestine occurs, to remove which would expose the patient to peril for his life, we choose an artificial anus; when in the larynx, a tracheotomy; in the pylorus, a gastro-enterostomy; and then later, if indicated, we are in better condition to institute more radical measures; yet when it comes to the bladder, we are told that so sensible a rule is not to be observed.

Again, recall for a moment the conditions obtaining, the very ones so strongly urged against suprapubic cystotomy,—namely, an old man with atheromatous arteries, exhausted from loss of sleep, with putrid, offensive urine, and possible pyelonephritis, and you are asked candidly, is there not vastly more danger to the patient in combining the technique of two operations—median lithotomy with prostatectomy or suprapubic cystotomy with removal of the prostate, in whole or in part, and subsequent suture of bladder—than there is in the simple opening of the bladder wall (in two steps if deemed necessary)? Recall the torn, unprotected tissues, bathed with ammoniacal urine, in a position where they cannot be seen or cared for, and the painful urination; then imagine a simple incision down to the bladder wall, this incision then packed with iodoform gauze for forty-eight hours, after Volkmann's two-step opening of an abdominal abscess, or

gall-bladder, or stomach; later, a simple puncture with a trocar, and the introduction of a tube of the same size. Here the cellular tissue has been shut off, there is perfect rest to the bladder, no chance for infection, no peritonitis possible; no pain (cocaine being amply sufficient for the second step). Which one of you but will say that the simple incision is the safer?

We said that the two factors in the indications are (1) safety and (2) complete rest. As to the latter, is it not equally apparent that the patient with the simple incised wound and siphon drainage will have more perfect rest than he who has had the neck and base of his bladder torn, scraped, gouged, or burned away, yet still has to use it in micturition? I think Kocher, in his operative surgery, explains why the low operation is preferred. He says, "that the incision from below has been practised so long is explained by the fact that the infection of the wound in the high operation could not be prevented."

I heartily agree with Broome, that "even were it possible by the suprapubic procedure to remove a portion of the projecting prostate sufficient to secure a low, level channel and perfect drainage of the floor of the bladder through the urethra, as advocated by McGill (and others), I, notwithstanding, believe the procedure wholly unjustifiable and inhuman, if there be the highly irritable condition that follows cystitis, or prolonged catheterism, and other like causes. . . . I wish to state, in this connection, that if a prostatectomy could ever seem to be justifiable, certainly the urethral route could hardly ever become popular."

Again, the teachings of Guyon and Launois, that the prostatic hypertrophy of later life is an accompaniment of a general senile arterio-sclerosis, has been proved to be only partly true, for Caspar, of Berlin, has shown by dead-house dissections that this association is only accidental. For example, in twenty-four out of twenty-eight old men examined, the prostates were enlarged and the aortas atheromatous, but only in two was there a general senile sclerosis of the urinary organs. Harrison's theory as to the hypertrophy seems to be borne out by the sequelæ of the high drainage, for that organ most often undergoes an atrophy which later permits the use of the normal channel again, as more than one can testify. For obvious reasons, then, I am convinced that whether it be by the methods of Mercier, Tobin, Treves, Bottini, Harrison, Dittel, Belfield, or Dolbeau, the attempt to remove as a primary operation the obstruction itself is both unsafe, unscientific, and many times unsuccessful. In other similar procedures we prepare the field of operation, and why not in this?

At the meeting of the Association of American Surgeons in 1887, Dr. J. H. Packard showed both by the history and from an anatomical standpoint that suprapubic cystotomy had been regarded with undue disfavor and neglect. In 1888, when their proceedings had been published, Sir Henry Thompson, who had been one of the earliest to advocate the operation, took pains to write to Dr. Packard, in order to correct any misappre-

hension as to his position. He said, "You have quite overlooked what has been appearing in my work and elsewhere concerning the prostate,—namely, that for nearly twenty years I have been advising and performing incision above the prostate, in cases in which prostatic patients found catheterism difficult, so as to provide a permanent drainage there. My first case was performed in University College Hospital, May 12, 1869. . . . Of late years I have considerably improved the method, and, were you now here, could show you a man in rude health, going about as usual, passing all urine into a receptacle, and but little inconvenienced." Sir Henry Thompson thought himself to be the first to make the suprapubic drainage, but Parrish quotes Wistar as having done it admirably before 1818. As further illustrating the change which Sir Henry Thompson's opinion has undergone—as I am sure will that of every one who performs cystotomies for this purpose—Packard quotes him (1883) as saying, "This operation has always been advantageous in a certain degree; . . . but the boutonnière of the French bids fair to be on the whole more valuable and more generally available." In 1886—note the change—he says, "Petersen's rectal distention has rendered an operation, formerly associated with some risk, almost absolutely safe as regards the peritoneum. . . . There is no risk of hemorrhage at all. . . . It is a very simple procedure, and easy of performance; much more so than median lithotomy."

The technique of this simple operation is to be found in all the more recent works on vesical surgery, and it only remains to recall some of the special points:

1. After irrigation with the antiseptic solution until it returns clear, distend without rupturing the bladder, with the antiseptic solution, and constrict the penis.

2. Put the rectal bag in place and gently distend with water.

3. In all the dissection, cut without tearing.

4. Gently separate the recti and pyramidalis with a few cuts; cut slowly through the presenting fascia transversalis with its fat, after pushing upward that at the upper angle.

5. Avoid the few prominent veins presenting.

6. When the muscular wall of the bladder is reached and the case is septic, pack the wound with gauze for twenty-four or forty-eight hours, at the point where you desire to puncture.

7. Cocaine, a four-per-cent. solution, will suffice for this operation. (I have done the entire operation, with removal of an immense stone, in a weak old man with chronic nephritis, using one per cent. freely.)

8. Drainage-tubes of various kinds are recommended. I have found the one sold at the instrument-makers as Andrews's empyema tube to answer the purpose. This is connected with a bottle under the bed by a siphon of rubber tubing and a piece of glass tubing bent at right angles, and fitting into the lumen of the drain. By this means the wound remains absolutely dry, and the bladder can be irrigated as often as desired.

9. The nature of a siphon and its method of working should be made clear to the attendants, so that they can see that it is working, and not obstructed with slime or clots. The long tube should be occasionally sterilized, and its end rest in a bottle which has some antiseptic solution in it.

10. Broome's suggestion to use a trocar for making the perforation in the bladder-wall, and to insert a tube of the same dimensions, is very good, because it prevents all leakage, and when a siphonage is employed, insures the good action of the latter by preventing the aspiration of air into the bladder, which is likely to occur if the drain fits the wound loosely.

MENTAL INFLUENCE IN THE TREATMENT OF DISEASE.¹

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IT can be assumed, I think, at the outset that all here will concede the proposition that mental, moral, and religious influences affect all people in various degrees, either harmfully or beneficially. The subject is a vast one, and includes and is, indeed, almost identical with the ancient one of "mind and body." I hope to develop only one thought in connection with it. I wish to enter a plea for a more careful study of the baneful mental influences and of those which are beneficial. Let us first consider some of the pernicious mental influences at work. Psychological epidemics break out from time to time and may be vastly more harmful to the communities in which they rage than epidemics of physical disease. In the latter case quarantine is probably established; the health officer takes charge; intelligent and active measures are taken to prevent the spread of the epidemic; and physicians are called upon to treat individual cases. This is not true of psychological epidemics. Faith-healers, spiritualists, clairvoyants, Christian scientists, public hypnotic exhibitors, and paranoic religious leaders set up their standards and preach their doctrines in various communities, and always gain some followers, always do some harm. Those who are mentally unstable—*e.g.*, the hysterical—receive these doctrines and are influenced often to a marvellous degree by them. As long as the propagators keep within certain limits prescribed by the law, they are undisturbed, and within these limits vast and incalculable harm can and has been done.

What can be done? To suggest a remedy which will wholly protect the psychically weak or deformed from becoming the prey of all these forms of psychological quackery and charlatanism does not seem possible.

¹ Paper read at the forty-fifth annual meeting of the Medical Society of the State of Pennsylvania, held at Chambersburg, May 21, 22, and 23, 1895.

But I believe that if it could be made unlawful for any one, other than a registered physician, to practise or attempt to practise hypnosis or to make a business of curing persons by mind cure, Christian science, and the like, very much would be gained. But it seems to me that before much can be done in the way of getting laws to prevent and check these psychological epidemics, some of which are present in a chronic form in our large cities, it is essential that physicians should have a better understanding of morbid psychology. It should be studied as carefully as morbid anatomy; we should at least attempt to grasp certain fundamental underlying truths in connection with it. Then can we better hope to establish some sort of public mental hygiene. It cannot be gainsaid that often apparently marvellous cures are effected by unauthorized persons practising hypnotism, faith cure, mind cure, and the like. Indeed, for my own part, I believe that a certain number of these cures are real and lasting and that some of them could not have been effected by the ordinary physician. One has only to examine into the literature to find unmistakable evidence in support of this proposition. In a paper read before this society in 1893 I cited a number of such instances.¹ Why, then, attempt to restrain these so-called healers? Just because the number harmed by those operating these cure systems is infinitely larger than those benefited, because it is not possible to exert the undoubted force for good which, to a greater or less extent, exists in all these systems, in an intelligent and discriminating manner in the way employed. To illustrate: suppose a sufferer from functional headache and one from hysterical hemiplegia were to submit themselves with the strong desire for and firm expectation of a cure² to a Christian scientist; suppose that, in a like frame of mind, a sufferer from empyema and another from cancer of the stomach were to present themselves. The symptoms in all four cases might be caused to disappear; but it is very certain that the diseased process in the last two cases, sapping away life, would not have disappeared, nor could we imagine how the symptoms would long remain absent. But in the first two instances the symptoms after disappearing might never return. Now place these four cases in the hands of the competent physician. The strong and confident hope of a cure, or hypnotic suggestion, might accomplish the same end. In the second two cases, the most advisable medical and surgical treatment would be instituted. If the diseases progressed in spite of this, the physician might do much to aid the patients by fostering in them that mental attitude which would render them best fitted to bear their burdens.

In the chronic, incurable diseases much can be done by efforts at promoting mental comfort, when little or nothing can be done by medicines. I suppose every one here has witnessed the peace and quietude which come

¹ Hypnotism and Suggestion. Transactions of the Med. Soc. of Penna., 1893. Also University Med. Mag.

² Op. cit.

through the Christian religion to certain chronic sufferers. It is entirely reasonable, and should be much more frequently seen than it is. Often laymen ask me the question, "Doctor, do you believe in Christian science?" I always answer "yes," taking care to explain what I mean by this: that the Christian spirit may lift a diseased person in some measure out of his physical pain or place him in an attitude better able to bear it; but that the ordinary means known to scientific medicine must always be used. This sort of Christian science I believe we can all advocate. It is the kernel of truth in the so-called system which goes by that name, the sophistries of which were clearly exposed in the admirable paper recently published by Dr. H. H. Longsdorf.¹ I believe that in the attitude I have indicated we have, in some measure, the answer to the question, "How are we to be armed against its inroads?" which Dr. Longsdorf asks in speaking of this pseudo-Christian science. Individual physicians can do much in individual cases in the way of restoring healthful mental action by showing the truth and dangers lying in faith cures. It would seem that the quack or charlatan often understands the subject of mental influences better than some honest members of our profession; and it is a great pity that he does, for by it I believe that he does his chief harm and gathers in a large part of his ill-gotten gains. His plan often is to create by mental influence a disease, or to greatly magnify one which does exist, and then cure it. In this way many so-called cancers, venereal troubles, etc., are cured by the quack.

Leaving, now, the public and the general considerations of this question, let us look at it as it comes to the physician in the treatment of his individual cases. This question of mental influence comes up more or less prominently in every case of sickness and injury. Briefly stated, there are two things to do,—

1. Remove baneful mental influences.
2. Surround the patient with all healthful mental influences.

How often does it happen that we see patients who are filled with ungrounded fears, constantly engaged in introspective thought, surrounded by a host of unhealthful mental influences, and whose mental state is such that it has greatly magnified the existent trouble or, indeed, largely overshadowed it? The strong assurances of the physician, given in a dignified, confident, and kindly manner, often at one leap place a patient on a plane where it is possible for him to get well. It would, of course, be impossible, in this very brief paper, to go into detail as to baneful mental influences; they will in individual cases suggest themselves to him who is on the alert for them. Nor, indeed, can the details as to healthful mental influences be considered, save for a word on the suggestions made by the physician. Patients often realize when there is an intelligent understanding of their

¹Christian Science and its Relation to the Medical Profession. Trans. Med. Soc. Penna., vol. xxv.

cases. Encouragement, kindly sympathy, and intelligent suggestions of cure or relief are to be reasonably employed, together with appropriate medical or surgical treatment. By these I believe we may employ all the real good there is in hypnotism, in the most natural and healthful manner, without exhibiting any of the mysticism and engendering any of the suspicion which come from hypnotic sleep. That these suggestions may be in any way helpful, the physician must appreciate and understand the fundamental truths of mental influence, and possess and cultivate in himself a character which will make his own personality one from which healthful suggestions will radiate.

The harm which may be wrought by dishonorable or vicious persons in using mental influences has been already indicated. Above all other qualities, he who uses these powerful and subtle influences should possess honor; and he must use intelligence, discrimination, and tact in their employment. In the hands of the upright and intelligent physician mental influence becomes a powerful therapeutic agent,—a vast engine for good.

REVIEW OF MEDICINE.

MEDICINE.

IN CHARGE OF JOHN H. MUSSER, M.D.,

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A Case of Infectious Icterus Levis. (*Deutsche medicinische Wochenschrift*, August 1, 1895.) By Professor G. Banti, of Florence.

N., aged twenty-two, of good family history, had never had any other disease than the present illness. On August 9, 1894, he was suddenly attacked with headache, chills, and fever. The bowels, moved with castor oil, were normally colored. Bleeding from the nose also occurred. There were no gastro-intestinal disturbances. On the 11th the urine was dark-colored, and on the 12th there was an icteric coloration of the skin and eyes. On the 13th he was sent to the hospital with a temperature of 39.9° C. His general condition was excellent. The liver extended two finger-breadths beneath the ribs, reaching up to the sixth and seventh ribs, and was slightly painful to the touch. The spleen extended three finger-breadths beneath the ribs, and was also slightly tender to the touch. The urine contained no albumin and did not react to Gmelin's test. On August

15 the urine passed measured six hundred cubic centimetres, and showed the presence of bile, the stool being well colored. The condition bettered itself, and on August 23 the patient left the hospital with but a slight yellowish coloration of the conjunctiva, the liver and spleen being free from pain on pressure.

The above is the clinical picture of what Stadelmann calls *icterus plerochromicus levis*. Suspecting the infectious nature of the disease, Banti, on the 15th of August, when the disease was at its acme, drew three cubic centimetres of blood from the spleen under the strictest precautions. This was distributed over a large number of agar tubes, as suggested by the author in *Lo Sperimentale*, April, May, 1890.

An organism called by Banti the *bacillus icterogenes capsulatus* was found in all the tubes. Gelatin is not liquefied; the cultures resemble the earlier growths of the cholera spirillum, or still more closely the bacillus of Friedländer, though growing somewhat slower than the latter. Casein is not coagulated in milk cultures, and the bacilli do not stain with Gram's method. The bacteria are four μ long by one μ broad, isolated or united, and the ends are rounded. Along with these forms are four others reaching the length of forty to sixty or even one hundred and fifty μ . In young cultures the capsule is especially readily stained with Ehrlich's solution. The bacilli are not motile. Mice when injected with bacilli beneath the skin die in three to four days, the bacilli often being found in the same capsule. The author has not yet completed his studies upon the organism, but while it most closely resembles the *bacillus rhinoskleromatis*, the *proteus hominis capsulatus*, and the *proteus capsulatus septicus*, there are certain points of differentiation which lead him to regard it as a separate variety of the family of encapsulated bacilli.

The writer does not consider that the organism found came from faulty methods of technique or was due to secondary infection, but that it was the cause of the illness. Attention is called to the fact that the stools contained bile during the entire sickness, and that there was thus no medicinal ground for the icterus.

The Quantitative Estimation of the Rennet-Zymogen; its Diagnostic Value in Certain Diseases of the Stomach. (*Medical News*, June 22, 1895.) By Julius Friedenwald, A.B., M.D., of Baltimore.

While variations are noted in the relation which the amount of hydrochloric acid secreted holds to the degree of pathological change of the gastric mucosa, the secretion of the ferments and their zymogens bears a definite relation to this change. The quantitative estimation of pepsin and its proenzyme has been attended with great difficulty; but the estimation of the rennet-ferment (lab) and its proenzyme (labzymogen) is very simple. In order to estimate the rennet-ferment, part of the gastric filtrate is exactly neutralized, and portions are diluted with distilled water, five cubic centimetres of each of these portions are placed in beakers and five cubic

centimetres of neutral milk are added and the mixture is placed in the thermostat. In order to estimate the rennet-zymogen, a part of the gastric filtrate is made slightly alkaline and portions of this are diluted. To five cubic centimetres of each of these dilutions one cubic centimetre of a one-per-cent. solution of calcium chloride is added and five cubic centimetres of milk. The dilutions can thus be detected at which these substances are no longer active. Under normal conditions the milk-curdling ferment may be present up to $\frac{1}{40}$ and the zymogen up to $\frac{1}{150}$. In those cases in which there is a normal or a diminished percentage of free hydrochloric acid, the milk-curdling ferment and its zymogen may be present in normal quantities or they may be markedly diminished. Their estimation, therefore, in these cases is of little value. The estimation of the milk-curdling ferment and its zymogen is of great diagnostic as well as prognostic importance in those cases of gastric disorder accompanied by an entire absence of free hydrochloric acid. In these cases (chronic gastritis or carcinoma) there is marked diminution of the zymogen, depending upon the severity and extent of the disease. In cases of nervous dyspepsia, as well as in secondary catarrh, the zymogen is present in normal proportions in dilutions of from $\frac{1}{150}$ to $\frac{1}{60}$. We can, therefore, readily determine whether there is actual disease of the gastric mucous membrane or simply a nervous or congestive condition. In those cases in which there is an absence of free hydrochloric acid and in which the labzymogen falls between $\frac{1}{60}$ and $\frac{1}{40}$, it is impossible to determine at once whether there is a catarrhal condition or whether nervous dyspepsia is present. Several examinations must be made to determine whether the labzymogen ranges above $\frac{1}{60}$ or below $\frac{1}{40}$. In cases of chronic gastritis the examination for labzymogen is of considerable prognostic importance. In those cases in which the labzymogen is diminished from $\frac{1}{15}$ to 0 there is no chance of recovery; in those in which it is diminished from $\frac{1}{40}$ to $\frac{1}{30}$ there is a possibility that judicious treatment may result in recovery. These conclusions are based on many hundred examinations. A series of tables is given showing the results in cases, in each of which three examinations were made.

The Varieties of Rheumatoid Arthritis. (*Lancet*, July 13, 1895.)
By R. Fortescue Fox, M.D. (Lond.), of Strathpeffer Spa, N. B.

A class of affections for which relief is commonly sought at mineral springs is the complex group known as rheumatoid arthritis. Of this disease several varieties are noticed clinically. First, the rheumatoid arthritis of young subjects. It is in the young that the disease assumes its most severe and intractable and typical form. A large number of joints are usually affected, and there are, from the first, profound debility, rapid heart, profuse perspiration, and progressive wasting. The articular symptoms vary according to the severity and duration of the malady. In the acute condition there are synovial effusion, heat, and extreme pain and tenderness. The second period of the disease is marked by degeneration

and atrophy of both joints and muscles, with more or less deformity. The middle phalangeal joints, the wrists, and the tarsal joints seem to be particularly obnoxious to the disease. This form occurs most frequently in females, thirty-two out of forty cases. The average age in this form was twenty-two years and a half. In some cases depressing illness preceded the arthritis. The exciting cause is frequently stated to be chill or cold. Certain climates seem to be favorable to the development of the disease. Among the symptoms which may be called prearthritic symptoms may be mentioned "a want of animal heat" and "a sense of chilliness" and various localized painful sensations. Second, generalized rheumatoid arthritis of the climacteric epoch. This, of course, is always noted in females, the average age of onset being forty-eight years. In many cases the disease is much less severe than in the first class of patients. Intermissions are not uncommon after the first onset, and, after a few years, comparative quiescence with localization in one or a few joints is much more frequent than in the arthritis of the young. There is less profound constitutional disturbance and a more favorable prognosis. In this form of disease prearthritic symptoms are very usual and may continue for two or three years. Climacteric arthritis attacks married women much more frequently than single, and the patients are, as a rule, mothers. The evidence would indicate that abnormal conditions of or disturbance of the function of the uterus or ovaries has slight bearing on the disease. Third, generalized rheumatoid arthritis in the old, senile rheumatoid arthritis. In this group males seem to be the principal sufferers, ten out of twelve cases, and the average age of onset fifty-six and a half years. This is the only form of polyarticular arthritis that can be truly said to belong to the degenerative period. Its onset is frequently preceded by nervous disturbance. The connection between rheumatic fever and rheumatoid arthritis is altogether exceptional and accidental. In respect to chronic rheumatism, the connection with arthritis appears to consist in the two facts that both disorders may be set up by exposure to cold and damp, and that in both there is usually a painful enlargement of the joints. Painful affections of the muscles, nerves, or joints frequently result from exposure to cold and damp, they affect elderly and predisposed subjects, their course is essentially chronic; but there is never the debility or cachexia of arthritis, and arthritis never supervenes on this form of rheumatism. The invasion of the joints is usually centripetal, beginning from the small joints of the extremities. Mental disturbance is noted as a companion to the disease most frequently in the senile group, but also occurs in the other two classes. Localized forms of arthritis are entirely separate from the generalized disease, and *nodi digitorum*, Heberden's nodes, and joint arthritis are middle-age or senile changes and are not associated with rheumatoid arthritis. The causation is complex: there is an inherited local vulnerability both of the nervous centres and of the joints; next a particular condition of disturbance incidental to different periods of life; then the depressing effect of acute antecedent illness; and,

lastly, external causes which affect first and chiefly the feet and hands. There is strong evidence that some implication of the nervous system takes an essential contributory part, and the disease may be looked upon as a neurosis of which the principal manifestation is found in the joints.

Of the Coexistence of Chicken-Pox and Measles in the Same Individual. (*Gazette des Hôpitaux*, June 15, 1895.) By Dr. Szczypiorski, of Longwy.

The author reports five cases in which were observed distinct attacks of measles and chicken-pox. The eruption of chicken-pox appeared first in all the cases and had not entirely disappeared when measles manifested itself. Since chicken-pox may be accompanied by a scarlatiniform eruption, which is polymorphous and resembles the eruption of measles, it is necessary to establish the differential diagnosis. The differentiation in these cases was easy on account of the coexistence of the two diseases, by the accentuation of the oculo-nasal and bronchial catarrh, and by the evolution of the eruption. In doubtful cases the diagnosis ought to be made if possible, for it is very important not to confound scarlet fever complicating chicken-pox with a scarlet rash occurring with that disease. It is equally important that the family be informed of the true meaning of the eruption.

Leucomaine-Poisoning. (*Medical Record*, June 22, 1895.) By B. K. Rachford, M.D., of Cincinnati, Ohio.

Leucomaine-poisoning is a very important phase of auto-intoxication, and it may manifest itself in at least three distinct but closely allied clinical forms; first, as a true migraine or leucomaine headache; second, as a migrainous epilepsy or leucomaine epilepsy; and, third, as a migrainous gastric neurosis or leucomaine gastric neurosis. Paraxanthin is by far the most poisonous of all leucomaines. Both paraxanthin and xanthin are poisonous leucomaines of the uric acid group, capable of producing the most profound nervous symptoms; they are readily soluble in water, urine, and blood. Paraxanthin is found in normal urine in such small quantities that its poisonous properties are lost in dilution. It is present in abnormally large quantity when it can be found in less than four litres of urine. Paraxanthin and xanthin are not formed in the kidney; they are excreted from the blood by the kidneys. The presence, therefore, of large or small quantities of xanthin bodies in the urine means that these bodies were present in equal quantity in solution in the blood previous to their elimination by the kidneys. Migraine, which has heretofore been ascribed to uric acid and to many other causes, is perhaps the most common manifestation of leucomaine-poisoning. In a case of migraine reported, paraxanthin has been found in two litres of urine during an attack, while between the attacks this substance could not be found. As characteristics of migrainous epilepsy we have: 1, the sudden onset of the attack, as a rule, without

warning; 2, muscles rigid, but not convulsed; 3, labored, gasping, irregular breathing; 4, unconsciousness from beginning to end of the attack; 5, heart's action rapid and strong. Examinations of the urine in an illustrative case show clearly that during these epileptoid attacks the excretion of urea is very much decreased and the excretion of uric acid is vastly increased. Paraxanthin was found in four litres of the urine, in large proportion. From the study of the case of migrainous epilepsy reported, the following summary of facts may be made.

1. Uric acid and its compounds are not poisonous.

2. Paraxanthin and xanthin are poisonous leucomaines of the uric acid group, which, when injected into mice, produce the following symptoms: 1, nervousness, extreme reflex excitability, almost a tetanus, and, at times, convulsive movements; 2, clonic tetanic stiffening of all the muscles, followed by muscular relaxation; 3, dyspnoea, orthopnoea, asphyxia; the gasping and difficult respiration is perhaps the most characteristic symptom; 4, stimulation of the heart, its movements being rapid and strong.

3. The patient during the interval between the attacks does not excrete sufficient paraxanthin to be detected in three litres of urine.

4. The patient during an attack excreted a quantity of paraxanthin and xanthin enormously in excess of the normal quantity. The paraxanthin thus excreted and obtained from three litres of urine produced in the mouse and rat the characteristic symptoms of paraxanthin-poisoning above narrated.

5. The attacks during and after which this patient excreted such large quantities of paraxanthin were very similar in symptomatology to paraxanthin-poisoning in the mouse.

6. The paraxanthin excreted in such large quantities just following these attacks must have been in solution in the blood during the paroxysm.

In the light of these facts it seems impossible to resist the conclusion that the attacks from which the patient suffers are due to the presence in the blood of an excess of paraxanthin and possibly of other poisonous leucomaines. A case illustrative of migrainous gastric neurosis is reported from which the following facts are obtainable: first, a family history of migraine; second, previous personal history of sick-headache; third, the patient now suffers from attacks of a severe gastric neurosis, which have recurred at intervals of two or three weeks, ever since the attacks of sick-headache ceased, five months ago; fourth, in four litres of urine, passed by this patient in the interval between these attacks, no paraxanthin was found and the "final fluid" was not poisonous to mice; fifth, in two litres of urine passed by this patient during an attack, both xanthin and paraxanthin were found in comparatively large quantities, and the "final fluid" was very poisonous to mice; sixth, from about one pint of stomach contents vomited by this patient during an attack, xanthin was separated, but no paraxanthin was found. The conclusion is that leucomaine-poisoning is a very important factor in producing these gastric attacks.

Enteric Fever in Children and Infants. (*Medical Record*, March 16, 1895.) By W. L. Stowell, M.D., of New York.

The paper is based on a careful study of thirty-four cases occurring in the author's practice and a tabulation of eighty-five cases of the disease in infants culled from the literature. The average age of all the author's cases was 7.97 years. All the cases tabulated as occurring in infants were found in individuals under three years of age. The mortality in children of average age was 2.95 per cent.; in infants the mortality reached 31.76 per cent. From the study of this series of cases the author draws the following conclusions: First, the disease is common in childhood and is not more rare in infancy than is explained by lack of exposure. Second, the types and varieties do not differ materially from those of adults. Third, the duration is shorter, because the tendencies in childhood are more towards growth and repair than in the adult, whose nutritive functions are all employed in repair alone. Fourth, the prognosis is best in children because they usually have healthy organs to fight the invader and so have few complications. Fifth, in infants the mortality is high, because the extremes of life are feeble, one having had no latent strength, the other having exhausted it. Sixth, children who die of enteric fever itself, die, as adults do, of perforation or exhaustion.

Cirrhosis of the Liver in Childhood, with Microscopic Report. (*Archives of Pediatrics*, July, 1895.) By William A. Edwards, M.D., of San Diego, California, and William M. Gray, M.D., of Washington.

The paper is a further study of a case, the clinical notes of which were reported on a previous date. The patient was a child, aged twelve years and four months, who was under observation for two years. The disease pursued about the usual course as seen in the adult. Thirty days before death ascites arose and paracentesis abdominalis was necessitated. The gain following the operation was of short duration, the urine became scant, high colored, and bile-stained, and was voided with difficulty; convulsions arose and the child died in one of the spasms. At autopsy the liver weighed six hundred and sixty-five grammes, and was a remarkable example of atrophic cirrhosis. There was an uncommon increase of inter- and intra-lobular connective tissue. The gall-bladder was comparatively normal. The kidneys were swollen, congested, hyperæmic, and the seat of parenchymatous nephritis, which was rapidly being transposed to a condition of interstitial nephritis. The vermiform appendix was gangrenous from its terminal extremity almost to its origin in the cæcum; but there was no perforation. This condition was probably due to the poor blood-supply of the organ, together with the pressure exerted upon it by the ascitic fluid and by a distended cæcum, colon, or ileum. It is remarkable that life could be sustained with such an important organ as the liver in so advanced a stage of disease. The affection can no longer be considered rare. The natural history of the disease in childhood shows that it does not differ

from the same disease in the adult. Its cause, clinical symptoms, diagnosis, and prognosis are identical. Alcoholism seems to have the same relation to the disease in early life as in the cirrhosis of adolescence or of advanced age. An attack of one of the eruptive fevers has an important etiological bearing.

The Meaning and Import of Casts in the Urine without Albumin. (*Medical Review*, June 29, 1895.) By Dr. Ludwig Bremer, of St. Louis.

A person who constantly or periodically passes urine containing casts, even without albumin, or perhaps with albumin in chemically demonstrable quantity, is not in good health. Such a person has a damaged constitution; his kidneys are, to say the least, vulnerable, and he is prone to contract and to succumb to other diseases. The irritative process which gives rise to the formation of casts may not amount to an actual state of inflammation, and there may not be the recognized signs of fully developed kidney-disease, and yet the subjective symptoms may be very pronounced. These symptoms are often unaccountable to the attending physician because sufficient importance is not attached to the presence of casts in the urine of such persons. In a number of cases periodic, intermittent albuminuria is the feature, and the albumin is in evidence only when a nerve storm of unusual severity has set in. Such patients may be considered to have vulnerable kidneys. For a long time such patients may not present any albuminuria, the casts only being demonstrable, or even these may disappear, and the urine be absolutely normal, yet there is a dormant pathological condition which may be aggravated into activity. The diagnosis of vulnerable kidney may be doubted by other physicians. Aside from examinations which are based on chemical analysis exclusively, there are several reasons why the search for casts may be negative: first, microscopical incompetency; second, the kidney trouble may have become latent and the casts may be really absent; third, insufficient instrumental equipment,—the centrifuge should always be used; fourth, the examiner, even if he find casts, may not attach any importance to them if unaccompanied by albuminuria. Among other reasons why the presence of casts in the urine is alleged to be compatible with perfect health is the finding of them in the urine of athletes after great muscular exertion. The athletes presenting this condition were certainly damaged men. The symptoms produced by this vulnerable kidney range over the neuroses, particularly neurasthenia, inexplicable gastro-intestinal manifestations, and grippe symptoms, megrim, and other forms of periodic headache.

Notes on the Etiology of Goitre. (*British Medical Journal*, July 6, 1895.) By H. C. L. Morris, M.D. (Brux.), L.R.C.P., M.R.C.S., of Hambleton.

The author practises in a district having a population of about two thousand, and he has had fifty-five cases of goitre under his care in the

past two and one-half years. The soil of the district is excessively chalky, and, with few exceptions, the water-supply is obtained from deep wells sunk into the chalk. When the springs are low the water is drawn up and even consumed while still milky in color. The author attributes the cause of the goitre to the presence of calcium and magnesium carbonate in the water. Heredity, intermarriage, and the presence of iron in the water, can be excluded as causative factors. The people who live on the tops of the hills and who drink stored rain-water are not affected with the disease.

The Knee-Jerk in Diagnosis. (*New York Medical Journal*, June 29, 1895.) By William M. Leszynsky, M.D., of New York.

Primarily, the knee-jerk depends on the integrity of the reflex arc, situated in the third or fourth lumbar segment. The ordinary and customary method of testing the knee-jerk, while the person's legs are crossed, may suffice when it is quite active; but the utmost care is necessary when there is any doubt as to the character of the reaction. It is never safe to say that the knee-jerk is absent unless repeated and varied tests have been made with the clothing removed. The exaggeration or absence of the knee-jerk, *per se*, is not pathognomonic of any special type of disease; corroborative signs must be present. The absence of the knee-jerk is of more positive value than its exaggeration. A lesion which involves the posterior roots or the posterior columns in the region of the second, third, or fourth lumbar segments, such as tabes or transverse myelitis, causes the abolishment of the knee-jerks, and these are the only lesions in the sensory tract that are known to cause such a loss. A lesion involving the motor portion of the reflex arc, such as acute or chronic anterior poliomyelitis, or multiple or isolated peripheral neuritis, affecting the anterior or-crural nerves, will also abolish the knee-jerk. The knee-jerk is present in children over three years of age.

1. Loss of knee-jerk associated with severe paroxysmal pains in the lower extremities, with incontinence of urine or slowness in emptying the bladder, with preservation of muscular resistance, with or without incoördination, with or without objective sensory symptoms, is indicative of organic changes in the lumbar segment of the cord, such as tabetic degeneration or a lesion of the posterior nerve roots.

2. Loss of knee-jerk associated with diminished muscular resistance or evident paralysis of the lower extremities, pain in the course of the nerve trunks with tenderness on pressure, some atrophy and quantitative decrease in faradic irritability, with or without objective sensory disturbances and the absence of bladder symptoms, is a clinical picture of multiple neuritis.

3. Loss of knee-jerk with flaccid paralysis, atrophy, and loss of faradic reaction in the quadriceps, and the absence of all sensory symptoms, indicates a poliomyelitis in the lumbar portion of the cord on the same side.

As a general rule the knee-jerk does not disappear so long as there exist in the reflex paths a certain number of healthy muscle and nerve elements.

On the other hand, in all lesions which affect the nerves in their totality the knee-jerk is abolished. In all cases of transverse myelitis, spinal cord hemorrhage, and traumatism of the cord, if we observe the abolition of the knee-jerks, an unfavorable prognosis should be given. In all cases of chronic, organic intracranial disease, in which indications of the position of the lesion are absent, the occurrence of this symptom suggests a cerebellar process. Changes in the unilateral reflex permit of the diagnosis of a one-sided lesion with greatest certainty, while an involvement of the reflexes on both sides, excluding polyneuritis, always indicates an affection of the central nervous system in its totality. The knee-jerk is occasionally absent in the early stages of meningitis; it is also absent when there is a supervenosity of the blood, in asphyxia from coal-gas, and in the acute stages of some cases of apoplexy. In distinguishing a genuine epileptic convulsion from simulation we must consider the absence of the knee-jerks and the absence of light reflex with dilated pupils as crucial tests in excluding simulation. The knee-jerk is absent in cases of diabetes only when there is peripheral nerve degeneration. Any obstructive or destructive process involving the upper or cerebro-spinal segment of the motor tract is likely to occasion an exaggeration of the knee-jerk. Should the lesion be situated above the crossing of the motor tract, the exaggeration occurs upon the opposite side of the body, while a lesion below would manifest its symptoms on the same side. This exaggeration may be demonstrated after the administration of certain drugs, as bromide; it may exist attending primary or secondary degeneration affecting the lateral columns of the cord; it may exist in some cases of hemiplegia from hemorrhage in the internal capsule; lastly, it may exist in the early stages of parietic dementia, except in those cases in which the posterior columns were primarily involved. As the knee-jerks are often pronounced or excessive in neurasthenia, hysteria, alcoholism, and mental fatigue, we must admit that in many instances the interpretation of such a symptom is more difficult than the interpretation of the absence of the knee-jerks.

A Case of Syphilitic Endocarditis causing Mitral Valve Insufficiency. (*Maryland Medical Journal*, June 22, 1895.) By Charles O'Donovan, M.D., of Baltimore.

The author reports the case of a man, aged thirty-six, who presented symptoms referable to the heart. This organ presented the murmur of mitral regurgitation, a thrill was felt, and the cardiac action was very irregular. The case was given the treatment ordinarily employed in cases of broken compensation; the patient did not improve. After a thorough and fruitless trial of these remedies, the possibility of a syphilitic taint became a strong probability, and the patient was put upon red iodide of mercury and iodide of potassium, and in three or four days the improvement was manifest, and in about two months the murmur could not be detected. This murmur could not have been rheumatic nor could it have been hæmic.

The course of the disease seemed gradually but surely progressive, alike under good care and attention as under the grossest neglect and positive abuse. No marked improvement followed any treatment until the patient was put upon the iodides, when he began at once to receive benefit. The course of improvement is so very like recovery from some syphilitic nervous lesion that the striking analogy renders the diagnosis almost certain.

The Modern Aspect of Indicanuria, with Special Reference to the Relation between Indican and the Acidity of the Gastric Juice. (*American Journal of the Medical Sciences*, July and August, 1895.) By Charles E. Simon, B.A., M.D., of Baltimore.

After a careful and exhaustive review of the literature, and after much original investigation and many experiments on the indican reaction of the urine, the author summarizes his results as follows :

1. The gastric juice possesses antiseptic and germicidal properties.
2. These properties are referable to the presence of free hydrochloric acid.
3. A subnormal amount of free hydrochloric acid will call forth an increased degree of intestinal putrefaction.
4. The conjugate sulphates form an index of the degree of intestinal putrefaction.
5. The increased intestinal putrefaction in cases of subacidity and acidity of the gastric juice is largely referable to an increased formation of indol.
6. The elimination of indican in the urine may be regarded as an index of the amount of free hydrochloric acid present.
7. A normal acidity of the gastric juice is never associated with increased indicanuria.
8. Cases of ulcer of the stomach apparently form an exception to this rule, an increased indicanuria being usually associated with hyperchlorhydria.
9. In other cases of hyperchlorhydria a subnormal or normal amount of indican is eliminated.
10. Simple constipation is rarely accompanied by an increased elimination of indican.
11. Diarrhœa referable to a catarrhal condition of the colon, often following a previously existing coprostasis, as well as diseases of the colon in general, is not associated with an increased indicanuria.
12. In the differential diagnosis between ileus and coprostasis, a small amount of indican excludes the former condition.
13. In cases of an achlorhydria with much lactic acid, the indican is not necessarily increased.
14. No indican, or but little indican, with delayed Gûnzburg potassium iodide reaction, indicates the absence of free hydrochloric acid, with much lactic acid.

15. Much indican, with a normal or anticipating Günzburg reaction, is suggestive of ulcer.

16. In cases in which the use of the gastric tube is impracticable or contra-indicated, or in cases of a mere superficial examination, the indican reaction will furnish a valuable index of the condition of the patient's digestive powers.

17. By means of the indican reaction we are enabled to follow very closely the results of treatment instituted in cases of gastro-intestinal disease.

Given as premises :

1. That a resorption of decomposing pus is not taking place anywhere in the body ; as such a process itself is capable of producing an increased elimination of indican.

2. That there does not exist a stenosis of the small intestine.

3. A normal mixed diet containing no excessive amounts of red meats.

The author does not wish to convey the impression, however, that with the adoption of this method the use of the gastric tube for diagnostic purposes should be abandoned. From a careful analysis of the urine, it is true, many points of undoubted value can be obtained regarding the condition of the stomach, small intestine, etc., but nevertheless, the information thus obtained cannot as yet be so complete as that furnished by a direct examination of the stomach contents. As confirmatory evidence, however, and as a method to be employed when, for any reason, the use of the tube is either contra-indicated or impracticable, the same will be found of decided value.

A Clinical Study of the Last Epidemic of Grippe which visited Athens. (*Le Progrès Médical*, June 22, 1895.) By Dr. Spiridon Kanelis, of Athens.

The epidemic began in the last fifteen days of December, 1893, and, after the first twelve days of January, 1894, abruptly ceased, only showing itself further by a few isolated cases. Following the epidemic the author noted five cases of typhoid fever and fourteen cases of chicken-pox in children, all of whom had previously suffered from influenza. The thoracic form of the disease was the most frequent, and presented slight symptoms of catarrhal bronchitis in some cases and in other cases severe bronchopneumonia. The pneumonias were characterized by absence of bloody expectoration, by a very prolonged respiratory murmur, and by the absence of the characteristic chill. The alterations in the bronchial tubes of a congestive type have been very slight. In five phthisical patients attacked by the grippe, the disease has been very slight. In three patients with asthma, an attack of grippe brought on new asthmatic paroxysms. In the nervous form of influenza all types of neuralgia were represented,—neuralgic headache, neuralgia of the heart, intercostal neuralgia, neuralgia of the shoulder and hip, pains in the loins, and sharp pains in the legs. As a rule, the

neuralgia affected the branches of the pneumogastric nerve. In several cases, neuralgias accompanied by slight malaise and a frequent pulse, without elevation of temperature, were the only symptoms of influenza. There were no hemorrhages observed, neither from the ears nor from the bowels. In females, menstruation was not more abundant nor prolonged, nor did it occur twice in the same month. Twice there was slight nosebleed. From these facts it is concluded that the infection was neither active nor severe. The gastro-intestinal form was marked by coated tongue, loss of appetite, constipation, and, at times, diarrhoea; bilious vomiting was occasionally noted. The majority of patients complained of pain in the throat followed by an inflammation of the pharynx and sometimes by a grippal tonsillitis. In other cases a unilateral tinnitus was seen. As sequelæ were noted urticaria, facial erysipelas, acute catarrhal cystitis in the female, hydrarthrosis of one knee accompanied by rheumatic pains in both knees and the tarsal joints. Influenza was also noted affecting children and infants.

Report of Five Cases of Thoracic Aneurism. (*Occidental Medical Times*, July, 1895.) By George Rothgauer, B.A., M.D., U. S. N., of Mare Island, California.

The author reports a case of aneurism of the ascending portion of the arch of the aorta, two of the transverse portion of the arch, one of the descending portion of the arch, and one of the thoracic aorta. The cases present several difficulties in the way of diagnosis. In the first case a murmur could be heard in place of the second sound at the aortic cartilage, and posteriorly, over the lower lobe of the left lung, friction sounds could be heard. There was severe pain in the chest. During the time the patient was under observation he had paroxysms of dyspnoea, with cyanosis and œdema of one foot followed by gangrene. At autopsy an aneurism of the ascending portion of the arch of the aorta was found, about the size of a pigeon's egg, which pressed upon the pulmonary artery. This pressure accounted for the cyanosis and dyspnoea. The second case applied for relief from rheumatic pains in the chest and shoulders. There were two hemorrhages from the lung during the illness and frequent expectoration of clotted blood. This case was also complicated by gangrene of the foot, and the patient died from the septic condition set up by the gangrene. At the autopsy an aneurism, the size of a gull's egg, was found at the beginning of the descending portion of the aorta. This aneurism projected into the left lung and had partly ruptured, thus accounting for the pulmonary hemorrhage. The blood entered the parenchyma of the lung and found its way into the smaller bronchi, and was then expectorated. There was no pressure on the bronchus or on the vertebral bodies and only slight pressure on the œsophagus. The gangrene was accounted for by the presence of an embolus in the left popliteal artery. In the third case there was a tumor in the sternal region extending above and below the second and third interspaces. Over this tumor there were a dull percussion note and a loud bruit.

There were also cough, greenish expectoration, and dyspnœa. This patient improved under Tufnell's treatment, but died finally from rupture of the aneurism, after passing from observation. There was no autopsy. The fourth case was first seen at the moment of death. The patient had complained of persistent pain in the back; but, as no objective symptoms could be found, he was considered a malingerer. The autopsy showed an aneurism, the size of a small fist, involving the thoracic aorta. It had ruptured into the left pleural cavity after having eroded the bodies of the sixth, seventh, and eighth dorsal vertebræ by its pressure. The fifth case was seen in a patient with a syphilitic history. The man complained of præcordial pain and tenderness, palpitation, and vertigo. There was a pulsating tumor between the lower border of the second left costal cartilage and the upper border of the fifth left costal cartilage; its right border was one inch to the left of the sternum and the left border was in the left mammary line. There was tracheal tugging and a murmur over the tumor. In this case Tufnell's treatment gave no benefit. The patient is still under observation.

Phosphorus in Oysters. (*Mercredi Médical*, June 19, 1895.)—Charin and Müntz have found that oysters, long known to contain much phosphorus, yield a notable, but variable, proportion of direct assimilable phosphorus in the form of a tribasic phosphate. One dozen Portuguese oysters contain 0.4 gramme of phosphoric acid, representing one gramme of the tribasic phosphate of lime. One-third less is obtained from the oysters of France.

THERAPEUTICS.

IN CHARGE OF ALEXANDER D. BLACKADER, B.A., M.D.,
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ASSISTED BY

D. J. EVANS, M.D.

The Alternating Treatment of Diabetes Mellitus. (*Bulletin de l'Académie de Médecin*, No. 23, 1895; *British Medical Journal*, August 10, 1895.) By P. Robin, M.D.

The writer, believing that in this disease there is an increased activity of the chemical changes of general nutrition, the result of increased activity of the nervous system, recommends the administration of drugs which diminish the activity of these changes by acting primarily on the nervous system. His treatment is divided into three stages: (1) For four days a powder containing about fifteen grains of antipyrin and eight grains of sodium bicarbonate is given twice a day. In addition cod-liver oil is taken with the meals, and Seignette salt as a morning purgative. (2) At the end

of four or five days the antipyrin is discontinued, and sulphate of quinine is prescribed, about six grains in a cachet at the mid-day meal. This is taken for six days, then discontinued for four days, and afterwards taken again for six days. Before the morning and evening meals a cachet is recommended containing arseniate of soda, carbonate of lithium, and codeia. (3) After fifteen days these drugs are discontinued, and the author prescribes for ten days a pill containing opium, belladonna, and valerian. The cod-liver oil is discontinued, and the patient allowed to drink a weak solution of bicarbonate of soda (1 in 125); bromide of potassium may be added if there is any intolerance of either the opium or belladonna. On account of the loss of inorganic salts in diabetes, the author endeavors to maintain the supply, by ordering a liberal supply of salt with the food, and the use of green vegetables.

If sugar is still present in the urine after the completion of this course, it is recommenced: after a second course, whether the sugar has disappeared or not, the drugs are discontinued for one month. By this alternating method M. Robin has treated one hundred cases of diabetes, in each of which the daily excretion of sugar exceeded one hundred grammes. In twenty-four of these recovery has occurred; in twenty-five recovery is still doubtful; in thirty-three there has been considerable improvement; in eighteen the results have been negative.

On the Action of Quinine on the Kidneys and Genital Organs during Pregnancy. (*Edinburgh Medical Journal*, August, 1895.) By George Coromilas, M.D.

This writer states that although in some cases quinine administered to pregnant women appears to have little oxytocic action, in others it has the power of exciting uterine contractions, more particularly in delicate, nervous, and anæmic women. He has also observed that quinine administered during menstruation in some cases stops the flow, and frequently diminishes it. He relates the histories of four cases in which quinine apparently induced labor-pains, and thinks that during pregnancy and menstruation, quinine should not be given in large doses, unless it be in conjunction with some narcotic that will act as a sedative upon the uterus.

Therapeutics of High Frequency Currents. (*Lancet*, August 10, 1895.)—In a short editorial reference is made to the important paper read by Dr. Apostoli on this subject at the meeting of the British Medical Association, which, it says, represents the direct practical application of physiological facts. A current of high frequency and high potential is caused to traverse a large helix inside which the patient is placed, and the effect is to set up induction currents of a similar kind inside the patient's body. These travel in closed circuits through the tissues, and produce nutritive changes, which can be recognized by their effect in increasing the elimination of carbon dioxide and of urea. The actual figures are prom-

ised at an early date. The results are good in diseases characterized by failure or impairment of nutrition, and accordingly Dr. Apostoli reports successes in anæmia, gout, rheumatism, neurasthenia, and hysteria. In diabetes, also, there have been some favorable cases. The principle of the localized application of electricity for the relief of disease, so ably insisted upon by Duchenne, has delayed the recognition of the important general effects to be obtained from electrical treatment. At present there is a distinct movement in favor of general electrification as a therapeutic means, and the results appear to be almost identical in character, whether the method employed be by the alternate current electric bath, advocated by Gautier and Laret, or the high potential induction method of Apostoli, or the electrostatic methods favored by Vigouroux and Morton, of New York.

Electricity in Medicine. (*New York Medical Journal*, May 4, 1895.)
By Wm. James Morton, M.D.

In a paper read before the Medical Society of the State of New York, the writer suggests as a definition of electro-therapeutics that it is, in a biological sense, the transformation, by the law of conservation of energies, of electric energy into the energy peculiar to vital cells. To be worked with successfully, it must be regarded not as an entity like a drug, but as having a considerable number of powers for action, or properties, such as electrolysis, cataphoresis, contraction of protoplasm, nutritional effects, etc., each of which properties may be employed, singly or combined, to combat morbid conditions. Retaining the familiar medical classification into galvanic, faradic, and franklinic currents, he states their properties as follows:

1. Of the galvanic current it may be concluded,—

(a) That strong currents depress nutrition of tissues and produce structural changes leading to physiological atrophy (twenty to a hundred milliampères).

(b) That mild currents stimulate nutrition and produce physiological hypertrophy (one to eight milliampères).

(c) That mild galvanic currents, pulsating or alternating, produce similar effects to mild continuous currents.

(d) That the negative pole is specifically indicated in that large class of cases termed chronic inflammation where newly-formed fibrous tissue or exudate occurs.

(e) That upon the writer's theory—already accepted by several prominent physiologists—and observations, that catabolic or destructive events in tissue uniformly present the sign of negativity,—that is to say, are at their origin electro-positive (resembling the zinc of a voltaic cell), the negative pole is indicated to arrest the catabolism, the positive to augment it.

(f) That the positive pole is rarely indicated, and, if so at all, upon the basis of an electrotonic effect to produce sedation of neuralgic pain in superficial nerves.

2. Of the faradic current it may be concluded,—

(a) That its main uses are to tetanize muscle and to cause sedation of pain.

(b) That the tetanizing current as now employed to treat paralyzed muscles is injurious, since it enfeebles the muscle and causes atrophic structural changes.

(c) That to strengthen or properly exercise a paralyzed muscle, a slow rhythm of the faradic current, about thirty waves to the second, should be adopted.

(d) That in some spastic conditions of muscles (due to paralysis of an opposing group) the strong tetanizing current may be used to advantage to over-stimulate, and thus to fatigue the muscle.

3. Of the franklinic current or static electricity, it may be concluded that it is an adjunct of great efficiency in practice, since—

(a) It evokes the usual nerve and muscle reactions.

(b) It affords a most convenient means of stimulating the peripheral distribution of the nerves in the skin, producing counter-irritating, reflex, and other afferent impression effects.

(c) It has a local perturbatory action (spark).

(d) It produces profound alterations in the metabolism of the individual, increasing the natural waste products and diminishing the toxic or by-products. For this reason it is specifically indicated in cases of malnutrition, whether local or general.

A Report on Salophen. (*New York Medical Journal*, May 25, 1895.)
By Bertram H. Waters, M.D.

The writer in this paper states the results obtained from the use of this drug in the treatment of acute rheumatic fever in the Presbyterian Hospital, New York. On commencing the treatment in all cases, an initial dose of from three to five grains of calomel, followed by a saline purge, was administered. In most of the cases an alkali was also given, either sodium bicarbonate or a combination of several of the potassium salts; occasionally morphine or immobilization of the joints during the first twenty-four or forty-eight hours was used for relief of the acute joint-tenderness. The drug itself was given in quantities varying from ninety to one hundred and twenty grains in the twenty-four hours. It was generally given dry on the tongue, and followed with water or milk. After recording the details of twenty-five cases, he draws the following conclusions:

1. That in almost every case improvement has been rapidly effected, and the average length of time for reduction of fever has been six days, as against eight days for the treatment by oil of winter-green, and nine days by the sodium salicylate.

2. That no complication more serious than the extension of the process to other joints was observed.

3. That the average length of hospital treatment has been under salo-

phen eighteen days, for oil of winter-green and sodium salicylate each twenty-five days approximately. This period includes after-treatment with iron and tonics.

4. That in no cases have gastric, renal, or constitutional disturbances been observed, while all these conditions have been developed under the use of other drugs. It is exceedingly easy of administration, and is not at all unpleasant to the taste.

A Note on the Therapeutic Value of Silver Nitrate. (*Dublin Medical Journal*, August, 1895.) By H. C. Tweedy, M.D.

In a short paper the writer relates the details of a case of locomotor ataxia, which was very markedly improved under the use of silver nitrate. Although the silver was given with much caution, and frequent and prolonged interruptions, argyria ensued. He concludes that no precautions can guard against the staining that follows the prolonged use of silver, but excepting the staining, silver nitrate appears to produce no injurious symptoms. At the same time no drug had the same beneficial action upon the symptoms as had the silver nitrate. The case was under observation for more than twenty-three years. The ataxic and neuralgic symptoms gradually disappeared under the use of the drug. On its discontinuance they returned after an interval, but vanished again and again on resuming the nitrate. Dr. Tweedy says, "It is now more than ten years since he showed any definite symptoms of ataxia. He has none whatever at the present time, and I think it may be fairly conceded that the discoloration of the skin has not been an extravagant price to pay for the benefits he has derived from the use of the drug."

SURGERY.

IN CHARGE OF HENRY R. WHARTON, M.D.,

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AND

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Post-Influenzal Osteitis, Periosteitis, Arthritis, and Inflammations of Fasciæ. (*Archiv für klinische Chirurgie*, vol. xlix., No. 3, 1895.) By Felix Franke, M.D.

This author calls attention to a new form of infective inflammation which he has observed subsequent to attacks of influenza, and of which he reports in detail twenty cases. The most frequent form is an osteitis or osteoperiosteitis which may go on to suppuration, or may produce simple

local swelling and cedema and be followed by resolution. Like all the other manifestations, it can only be diagnosed by its proximity to an attack of influenza, or by the presence of symptoms of that disease concurrently with it. When any of these inflammations resist all treatment and go on in a chronic course of latent character, the possibility of an etiology in influenza should not be overlooked, and a history of a series of attacks or the presence of symptoms should tend to confirm the diagnosis. Osteoperiosteitis is the most frequent form, and under it may be classed, according to this author, the disease described by Albert as "Achyllodynie," where the insertion of the tendo Achillis is the seat of a periosteitis. The involvement of fascia is next in frequency, and chiefly an inflammation of the plantar fascia, whereby it becomes thickened without outward signs of inflammation; the thickening is usually along the inner border and at the insertions of the fascia. It is slightly sensitive to pressure, and is painful to stand or walk upon for any length of time. Arthritis, having as its sole cause an infection due to influenza, is seldom seen, but does doubtless occur. The symptoms may manifest themselves three or four days after the inception of an influenza, but may be latent for even many weeks.

The resistance to all treatment is very marked; the best results are derived from the applications of moist heat and massage, with incision and drainage in cases that go on to suppuration. The salicylates have been of no avail, as also all ointments and counter-irritation, except, perhaps, in certain cases of ichthyol.

The Radical Operation for Inguinal Hernia in Children. (*Archiv für klinische Chirurgie*, Band xlix., Heft 4, 1895.) By Wm. Bittner, M.D., of Prague.

The author reports thirty-eight cases of hernia in thirty-four patients, with one relapse, and one death from lobar pneumonia in a child that was found to be markedly tubercular. In four cases operated on for strangulated hernia one died that was comatose at the time of operation. The author believes that in children the radical cure is preferable to treatment by truss, as there are many cases which a truss cannot cure, and in which relapses and grave complications arise during the wearing of one. There are many cases in which the truss does not hold the hernia in a safe and proper position. From the social stand-point, the truss produces bad effects on the mental condition and development of the individual. In all cases of strangulated and incarcerated hernia the radical operation should be performed. Healing follows on an average in ten days, and the operation is well borne by children. The operation preferred by the author is a simple suturing of the canal. After an incision extending longitudinally over the hernia from the internal ring downward and the division of the cremaster muscle, the cord is sought for, and the sac laid bare by careful dissection on the grooved director. It is then easy to dissect it out by blunt dissection, except, perhaps, where the sac is adherent to the tunica vaginalis testis when

that organ is exterior to the sac. When the sac is entirely free up to the external ring, the contents are reduced and the sac is ligated as high up as possible and divided. When the external ring is large and there is free communication with the peritoneal cavity, it is better to suture the neck of the sac by a running suture. The inguinal canal is now closed by interrupted sutures, five or six in number, using curved needles, and including as much of the walls of the canal as possible, the cord being guarded meanwhile by the finger. In complicated cases the anterior wall of the canal may be divided, and then both deep and superficial sutures are required. If the testicle is within the sac, sufficient sac should be left to cover it, and should be sewn over it with a running catgut suture. Complicating hydroceles should be treated radically by removing the lining membrane. Silk was the material employed for sutures and ligatures. The dressing was of iodoform gauze, cotton, a protective to prevent soiling of the dressings, and a bandage. The dressing was changed immediately if soiled. The stitches were removed six days after operation. There was but slight rise of temperature the day or two following the operation, and recovery was usually rapid and without complications.

The Mortality in Two Thousand Six Hundred and Fifty-eight Cases of Diphtheria treated in the Surgical Clinic of the University of Berlin. (*Archiv für klinische Chirurgie*, vol. xlix., No. 4, 1895.) By V. Hirsch, M.D.

Of the two thousand six hundred and fifty-eight cases of diphtheria treated in the past ten years in this hospital, one thousand three hundred and ninety-six, or 52.5 per cent., died. The greatest mortality was seen in the winter months; the greatest frequency was in October, while the least was in June. The age of the child alters the prognosis, the mortality being greater the younger the child. The operation of tracheotomy was performed in all cases in which there was marked interference with respiration. No child was allowed to die of suffocation through a stenosis of the larynx. The operations were sometimes done when there was but little hope and the patients had already become cyanotic. Of the two thousand six hundred and fifty-eight cases, one thousand five hundred and fifty-four were operated upon, with a mortality of 68.7 per cent. in those not operated upon. This percentage compares very favorably with statistics previously published, in which the average mortality after operation was 73.3 per cent. The greater mortality was found to be in the first two years of life, and yet the results obtained in four hundred and seven cases in which the operation was performed in children under two years of age was not bad. Twenty-five of those who were so dangerously ill that they would certainly have died without operation and who were moribund at the time of entry into the hospital recovered. In reference to the complications of nephritis and scarlet fever, the statistics show that the prognosis is always bad in cases complicated by nephritis, while that of scarlet fever, though slightly better, is not good. In two hundred

and twenty-eight cases complicated by scarlet fever only eighty-five, or 37.2 per cent., required tracheotomy. The statistics show that the later the children came under treatment the worse was the prognosis.

Splenectomy for Echinococcus Cyst of the Spleen. (*Deutsche medicinische Wochenschrift*, July 11, 1895.) By E. Hahn, M.D., of Berlin.

S., a woman from Berlin, aged thirty-five, had suffered for the past eight years from joint rheumatism. She had given birth to eight children, and had aborted twice. During her last pregnancy œdema of the lower limbs was present, which afterwards disappeared. Soon after the birth of the child the patient noticed a swelling in the left side of the abdomen, which grew rapidly. Her strength began to fail. Heart's action arrhythymical, slight systolic murmur at the apex. Lungs normal. Urine free from albumin. Uterus and adnexa normal. There could be felt in the left side an easily movable tumor, the size of a child's head, extending from the brim of the pelvis to beneath the ribs, but not beyond the umbilicus. The tumor fluctuated on pressure, and the lower edge of the spleen could probably be defined. An operation was performed on February 5, 1895, about three months after the appearance of the tumor. A large incision was made in the linea alba, half above and half below the umbilicus. The tumor was drawn out through the wound and was found to consist of a cystic degenerative spleen. The convex surface was composed of thin splenic tissue, the upper and lower border showing the splenic tissue more plainly. The cyst lay in the centre of the spleen, growing especially towards the concavity, and making a tumor half the size of a child's head. There were no adhesions; the vessels entering at the centre were well developed, and were tied in several places with fine silk. The peritoneum was sewn with catgut and the external wound with silk sutures. The spleen with the tumor weighed eight hundred and fifty grammes; length, twenty-six centimetres; breadth, eleven centimetres; thickness, twelve centimetres. The blood-counts gave 4,500,000 red blood-cells in a cubic millimetre, the whites being in proportion to the red as 1:160. No fever and but slight bad after-effects were noted from the operation. A pleurisy developed which quickly healed. On April 3, when the patient was discharged as cured, she had regained the weight which she had lost after the operation. Red blood-cells, 4,975,000; white to red 1:323. During this time swelling of the thyroid gland or of the lymph-glands was not noticed. When last seen, on June 6, the woman felt well, the red blood-cells were 4,408,333 in the cubic millimetre; the white to red 1:610.6.

There are six other cases collected from the literature which were operated on by Koeberle (death), Von Bergmann (cure), Durante (death), Mâs (cure), Novarro (cure), and Snegirjeff (cure). The two cases which died had strong adhesions to the neighboring organs, while the five which recovered showed few or no adhesions. The four cases of blood-cysts

found in literature all recovered ; this would make a mortality of eighteen per cent. for these two conditions.

Perforated Gastric Ulcer.—Curt Pariser (*Deutsche medicinische Wochenschrift*, July 11, 1895) has tabulated forty-three cases, with ten cures, in which operative measures were taken after perforation of a gastric ulcer. The ten cures were effected by the following surgeons: Taylor, Hensner-Kriege, Morse, Maclaren, Michaud, Roux, Nicholson, Morris, Hastings-Gilford, and Bennet. The ulcer was situated twice on the lesser curvature, six times on the posterior wall, and twenty-two times on the anterior wall of the stomach. Eighty-six per cent. were in women. The operation should be performed within at least ten hours after the perforation has taken place.

NEUROLOGY.

IN CHARGE OF LANDON CARTER GRAY, M.D.,
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Syringomyelia.—Professor Raymond, the successor of Charcot, demonstrated in his closing lecture at the Salpêtrière, Paris, June 28, 1895, an unusual case of syringomyelia. The patient presented the Brown-Séquard symptom-complex. The upper and lower extremities of the left side of the body were paretic, the objective sensation was not altered, and the arm of this side was considerably smaller than that of the other. In the right half of the body in both limbs the sensation for touch was not changed, whereas for pain, heat, and cold a great difference from the normal condition was noted. The disease had been gradually developing for twenty years. There was no history of syphilis. Paræsthesia had existed in all the extremities, but the disturbance of motion was clearly limited to the left side; on the contrary, the change in sensation peculiar to syringomyelia was only found on the right.

The sympathetic nerve of the neck was involved on both sides, more, however, on the right. Double myosis, ptosis of moderate degree, and retraction of the eyeballs were noticed. The ear on the left side was of a much deeper color than that on the right. Several cases of one-sided syringomyelia are on record, but the symptom of Brown-Séquard is unusual in such conditions.

As a complement to the above Professor Raymond also showed a case of syringomyelia affecting the base of the brain, and giving rise to attacks of vertigo of a most painful type, and the Argyll-Robertson pupil.

Schlesinger, in Vienna, has already described the occurrence of this condition of the pupil in syringomyelia.

Experimental Inquiry upon the Afferent Tracts of the Central Nervous System of the Monkey. (*Brain*, Part lxix.) By F. W. Mott, M.D., of London.

In a series of fourteen experiments on monkeys the author has derived some very important facts. The column of Goll, according to him, is composed chiefly by the fifth, sixth, and seventh subthoracic roots, and few fibres enter this column above the fourth subthoracic. After uncomplicated, unilateral section of a large number of posterior roots there is no degeneration in the opposite posterior column. This is opposed to the report of Oddi and Rossi and Löwenthal. When the nucleus of Goll is destroyed the degenerated fibres extend in the fillet as far as the optic thalamus and not beyond; thus confirming the opinion held by Dejerine from the study of secondary sclerosis in man, and by Von Monokow from experiments on animals. After unilateral section of roots, degenerated fibres were found in the opposite antero-lateral column, but, as such fibres were not always present, he attributes their origin to cells of the gray matter of the same side as the lesion, and he thinks that these cells have been damaged by vascular changes in the gray matter, as a result of the operation; he does not believe that any long ascending fibres in the antero-lateral columns, or the posterior column of the opposite side, arise directly from posterior roots. After median longitudinal section in the lumbar region for three-quarters of an inch he has found a symmetrical degeneration in the antero-lateral tract of the two sides. There are two sets of fibres here, one of which can be traced to the vermis, the other (column of Gowers and Edinger) to the corpora quadrigemina. Experiment has shown that this tract of Gowers and Edinger has probably nothing to do with the conveyance of faithful impressions. One-sided or double division of the antero-lateral portions of the cord produces no obvious effect on sensation. The function of this tract is unknown.

Diaphragmatic Phenomenon in Paralysis. (*Gazette Médicale de Paris*, June 1, 1895.)—Féré calls attention to the diaphragmatic phenomenon of Litter, which consists in a diminution of the amplitude of the *onde* diaphragmatic on the paralyzed side of hemiplegics. This is even more marked in the case of infantile hemiplegia, where the author has demonstrated its presence in thirteen cases; there may be at the same time a diminution on the opposite side.

Thomsen's Disease; Report of a Case, with Autopsy. (*Revue de Médecine*, March 10, 1895.)

Professor Dejerine of the Salpêtrière, Paris, and his former interne, Dr. Sottas, have given an important contribution to medical literature in the report of the first autopsy ever made in the disease described by Thomsen in 1876. It is well known that Thomsen observed the symptoms in

himself and several members of his family. From time to time fragments of muscles excised from the living person have been examined.

In 1886, Erb described the peculiar electric reactions which he had observed. The disease is characterized by an augmentation of the muscular masses, with disturbance in the voluntary movements. The power of the muscle is not in proportion to its development, and at the moment of contraction a rigidity is produced which interferes with the movement. Once the contraction is effected it persists a certain time and offers a resistance to antagonistic movement. The electric examination shows an exaggeration of the faradic and galvanic excitability of the muscles, with a tendency to reaction of degeneration. Erb has described undulatory contractions persisting after closing the galvanic current, which pass from the negative pole to the positive,—his myotonic reaction. The reaction of the nerve-trunks is normal. Usually the disease begins in infancy, and is found in several members of the same family.

The case published by Drs. Dejerine and Sottas answered the accepted description of the disease. A brother and sister were free from all symptoms. From early infancy the patient was weak in the lower extremities, and as he advanced in years this weakness became more marked; however, as he approached his twentieth year he acquired sufficient force to perform a fatiguing occupation. At the age of thirty-two his lower limbs were developed to an abnormal degree, whereas the upper might have escaped observation as being pathological; and the symptoms of the disease were well marked. He died at the age of thirty-seven from acute nephritis. It is difficult to determine in this malady the progress of the muscular alteration. In the muscles of the superior portion of the body the changes were less; it is logical, therefore, to seek here the primary lesions. A nuclear hyperplasia seems to be the first stage; this was found in the muscle of the tongue, which was free from all other alteration, and here the indications of active cell-division were observed. The muscular parenchyma was swollen, and presented a hypertrophy *en masse* of the fibre. This hypertrophy tended to efface the angles of the outlines and to give a rounded appearance to the fibre. Later when further alterations occurred the fibre was found more irregular. The longitudinal striation often failed, whereas the transverse was perhaps even exaggerated. The hypertrophy was especially noticed in the muscles of the calf. The protoplasm, which in the normal condition surrounds each muscular fibrilla, was highly developed in certain fibres. In some cases vacuoles were found. The muscular tissue, either swollen and homogeneous or else divided by the development of the interfibrillary protoplasm, later underwent further modifications. In some regions it was divided into blocks more or less separated and free in the dilated sheaths, at other locations it suffered a fine disintegration, which was more frequently found in the centre of the fibre and gave rise to vacuole formation. In other spots the non-specialized protoplasm predominated, and at times formed balls at the periphery of the fibre.

In more advanced changes the entire contents of the sheath were disintegrated and only fragments of protoplasm were left.

The connective tissue remained inactive, except where it developed in order to fill the spaces left vacant by loss of muscular parenchyma; it was never the seat of an active hyperplasia. The nuclei were rare. In the cord, roots, and nerves no pathological changes were noted.

The authors call attention to the fact that those muscles which are more liable to excessive exercise, as those of the calves, are the ones that suffer the greatest hypertrophy. The histological examination in this case, while coinciding with the description given by Erb of the examination of fragments of muscles removed from the living being, presents still new features. The absence of hypertrophy of the muscular fibre at the very beginning of the lesion, at the period when the hyperplasia of the nuclei has begun, likewise the hypertrophy in those muscles most used, give ground for supposing that this enlargement is due to abnormal functional activity.

The integrity of the nervous system places the disease among the primitive myopathies.

W. G. S.

Three Cases of Chronic Abscess of the Brain. (*Medical News*, July 27, 1895.) By J. T. Eskridge, M.D.

The three abscesses in the right cerebral hemisphere in each case, all occupied nearly the same position in the centrum ovale, were all attended with left lateral homonymous hemianopia, with great weakness of the left arm and leg, the loss of power being greater in the leg than in the arm, the face escaping almost entirely, and with sensory impairment on the left side. The infective material in two was probably derived from distant supuration, and in one from an injury of the scalp, although the incomplete post-mortem examination renders this uncertain.

A New Theory of Sleep. (*Medical Record*, August 3, 1895.) By Ramón y Cajal.

This author maintains that while nerve-cells do not have amoeboid movements, there are scattered richly throughout the brain tissues other cells known as neuroglia cells which do possess this power. These are cells with very numerous fine processes, and they form in a large measure the supporting framework of the brain tissue, sending their fine processes in among the nerve-cells and blood-vessels. Cajal's theory is that these neuroglia cells during repose extend or relax their fine hair-like processes. As the result of this the perfect contact between the processes of the nerve-cells and the end-brushes from the axis cylinders that surround them is interfered with, hence the brain function is slowed up and sleep ensues. During activity these neuroglia cells retract their numberless fine processes, the contact between the nerve-cells becomes perfect again, and mental functions are resumed. The practical facts upon which Cajal bases this ingenious theory are that the neuroglia cells are found to be in different

states. In some their processes are retracted and shrivelled and in others they are extended. There is unquestionably an amœboid movement, therefore, in this class of cells. Furthermore, it is in accordance, he says, with physiological facts that a cell would retract its processes during activity and relax them during repose. The physical basis of sleep, therefore, according to this view, would be the bristling up of the hair-like processes of the neuroglia cells, a squeezing of them in between the machinery by which the nerve impulses pass, and a sort of clogging of the psychical mechanism.

Four Cases of Friedreich's Ataxia. (*Medical Record*, July 20, 1895.) By Sidney I. Small, M.D.

Three of the cases have been for a number of years inmates of St. Mary's Hospital, Saginaw, Michigan, the fourth is living in Essexville, of the same State, in which place all the children were born. The father, a stout, strong man, was a native of Holland, and came to America at the age of twenty-five. He died at sixty-one of gastric cancer. The mother was a French Canadian who died at thirty-eight of blood-poisoning, the result of vaccination. The children of these parents are two sons, aged twenty-five and twenty-four, and two daughters, aged twenty-six and twenty-two. In the first case station was affected at about the age of nine and gait at thirteen; at nineteen she took to crutches, but after four months had to abandon them for an arm-chair. In all the cases the symptoms came on at about thirteen or fourteen. Scoliosis is present in the two eldest. The patellar reflex is absent in three. In the third case there is a slight oscillation of the head which is increased by conversation or excitement. In the first two cases, particularly, the speech is slow and unsteady. There is hyperextension of the thumb in all the cases. In none of them has there been pain, anæsthesia, or girdle sensation. Nystagmus has not appeared as a prominent symptom. In three cases some atrophy of the optic nerve is present.

Insanity cured by Removal of a Fibroid Tumor of the Ovary. (*Southern Medical Record*, July, 1895.) By Emory Lanphear, M.D.

The patient, aged thirty-six, was married at twenty and had four children. For several years she had had a slowly-growing, small, very hard tumor in the pelvis, which pressed upon the bladder, causing marked vesical irritation. For more than a year this tumor seemed to generate serious disturbance at the menstrual periods, and finally typical menstrual mania developed about January, 1891. The attacks became so severe and so long-continued that she became dangerous and was admitted to a hospital for the insane. No proper treatment was here instituted, but on being transferred elsewhere cœliotomy was performed and a true fibroid of the ovary, measuring two and a half by eight inches, was removed from the right side. The left ovary was also removed with its tube. The maniacal excitement returned at the next period, her mind not being exactly right at

any time. The attack lasted for four or five days, followed by quiescence until the next period, when a milder attack ensued; and so the case progressed until in nine months she was discharged and for three years has remained well.

The Formation of the Column of Goll and its Freedom from Endogenic Fibres. (Society of Biology, June 15, 1895.) By Professor Dejerine and Dr. Sottas.

The column of Goll contains no fibres which have their origin in the spinal gray matter; those which compose it come from the posterior roots, and only at the superior part of the lumbar cord begin to associate themselves for the formation of this column. The fibres which enter it at higher levels do not mingle intimately with those which have come from more inferior regions,—they are simply added to those already existing there. This column sends forth fibres, but receives no short ones. These convictions depend upon certain cases which have been examined, among which three have been chosen for demonstration. In the first, a compression of the cauda equina, due to fracture of the inferior vertebræ and luxation of the sacrum, had destroyed all the spinal roots as far as the fourth lumbar inclusive. The sclerotic condition in the column of Goll was preserved in the same intensity of degeneration at all levels. The zone was diminished in extent in its ascent, but contained no new sound fibres. This proves that the degenerated area only consists of long fibres of the diseased lumbar and sacral roots. The second case was similar to the first. The third was the most demonstrative of all. A transverse syphilitic lesion in the dorsal cord, reaching as high as the third dorsal root, had produced a sclerosis of the column of Goll, which occupied its entire area, and left not a single sound fibre in it at any level above the lesion. The gray substance in this region, however, was intact. Therefore, as the secondary degenerated area of Goll's column preserves its intensity of alteration in all parts of its course, it seems certain that this column receives neither descending posterior root collaterals nor endogenic fibres. Such collaterals remain in the column of Burdach. The endogenic fibres of the posterior cord are found in the zone adjoining the base of the posterior horn at all levels of the cord; in the median zone of the lumbar cord where Goll's column does not yet exist, and in the internal portion of Burdach's column in the cervical and dorsal regions.

W. G. S.

Spastic Cerebral Diplegia.—Professor Oppenheim a short time ago presented in Berlin a mother and child afflicted with spastic cerebral diplegia. The trouble in the mother dated from early infancy, involving the four extremities, the trunk, and head. She would speak and swallow only with great difficulty. The child was not as seriously afflicted. There must be in both patients congenital lesions of both cerebral hemispheres, involving especially the motor regions.

OBSTETRICS AND GYNÆCOLOGY.

IN CHARGE OF RICHARD C. NORRIS, M.D.,

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Relation of Lithæmia to Diseases of the Pelvic Organs in Women.

(*Annals of Gynæcology and Pædiatry*, June, 1895.) By Matthew D. Mann, A.M., M.D., of Buffalo, New York.

The urinary, alimentary, and genital organs situated in the female pelvis are intimately associated in function as well as in position. The relation of position may be demonstrated by the course of gonorrhea, which may infect the urinary tract, even as far as the kidneys, and the rectum, as well as the genital canal. This is also true of septic disease, though to a less degree. Through the nervous and vascular connections, the secretions of the different glands found in or connected with these organs may be more or less reciprocally affected. The victims of morbid conditions depending on the close interdependence of function and disease in the nearly associated pelvic organs complain of many symptoms, subjective and objective. They tell us of pains and aches in various places, many of which we call reflex. They complain of menstrual disturbances, vaginal discharges, backaches, and frontaches, troubles with the bladder and rectum. They suffer from insomnia and dyspepsia; and, above all and before all, they tell us that they are nervous. Often the spirits are depressed, and there is sometimes a fear of impending insanity; headaches, especially occipital, and intercostal neuralgia are common. A physical examination often shows no serious lesion of the pelvic organs. An examination of the urine will give much information; usually the quantity is below the normal, the reaction excessively acid, and uric acid is present in abnormally large quantities. At times the urine will be clear, limpid, and of low specific gravity. The blood also should be examined, for anæmia is one of the most important associates or causes of excessive uric acid output. In cases presenting these combinations, the question to be decided is whether the trouble is primarily with the uterus and ovaries, and all the rest reflex or secondary, or *vice versa*. It is possible to group such cases under the term lithæmic or under the term uric acid diathesis; but the best plan is to consider them as cases of general disturbance of nutrition, and then we shall be forced to study each case to find out exactly the origin of the disturbance. The pelvic lesions may be the cause or they may be the result. We can get more help in understanding these cases by remembering the close relations which exist between the circulation of the pelvis and that of the liver; also by remembering the dependence of the kidneys upon the proper performance of the functions of the stomach and liver; and again, by remembering the intimate nervous connection between the uterus and these other organs. If the trouble starts

in the stomach from an error in diet, or from overwork or nervous strain, there result imperfect metabolism of the food products, the formation of poisonous substances, the imperfect action of the skin, kidneys, liver, and bowels, failure to excrete the toxins, and the production of an auto-intoxication resulting in nervous and functional disturbances. This train of events, slightly modified, may be due to an abnormal urine, to rectal disorder, or to primary uterine disorder. The special causes will be found in the climate, diet, social condition, the wear and tear, the hurry and rush, and the fatigues and strains of modern life. The influence of dress has an important place in the causation of these conditions, and any garment that produces even moderate waist-constriction should be discarded.

Renal Insufficiency in Gynæcological Cases. (*Chicago Medical Recorder*, July, 1895.) By J. H. Ethridge, M.D.

Attention is called in this article to the close relation existing between renal insufficiency and pelvic disorders. As the mesoblast in the ovum gives rise to both the urinary and the generative organs, it is an easy matter to infer that derangements in one set of organs can produce, or at least are very frequently associated with, derangements of the other. Observation shows numerous cases of coexistence between renal insufficiency and neuralgias, mucous membrane disorders, and serous membrane inflammations, and one cannot but question the possibility of this insufficiency producing or permitting amenorrhœas, dysmenorrhœas, leucorrhœa, and attacks of pelvic peritonitis; for it is a matter of daily observation to see gynæcological patients with renal insufficiency who present these disorders, and also neuralgias, dyspepsias, bronchitis, cutaneous eruptions, headaches, backaches, nervousness, and insomnia.

The normal excretion of urinary solids in human beings, weighing from ninety to one hundred and eighty pounds, varies from five hundred to eleven hundred grains daily, as shown by the following table:

Weight.	Urinary solids.	Weight.	Urinary solids.
40 pounds	392 grains.	130 pounds	1028 grains.
50 "	479 "	140 "	1078 "
60 "	563 "	150 "	1150 "
70 "	639 "	160 "	1198 "
80 "	716 "	170 "	1237 "
90 "	789 "	180 "	1260 "
100 "	854 "	190 "	1300 "
110 "	916 "	200 "	1330 "
120 "	974 "		

A simple formula for estimating the solids of the urine is that known as Haines's modification of Haeser's method. It is this: multiply the last two figures of the specific gravity of the urine by the number of ounces voided in twenty-four hours and the product by one and one-tenth.

Women passing only fifty per cent. of the normal amount of urinary

solids are extremely numerous. If only four hundred grains are excreted daily, various degrees of nervous irritation are presented; if this amount is diminished to two hundred grains, the nervous system is very seriously invaded; and if still further diminution occurs, say to one hundred grains per diem, the patient will be found dangerously near the verge of uræmic convulsions, the condition not infrequently found in the last weeks of gestation. Appropriate remedies used in these cases increase the amount of urinary solids and the urgent symptoms subside. From the fact that many gynæcological cases are relieved by including in the treatment remedies that increase the urinary solids, the conclusion cannot be resisted that cause and effect actually exist between many of them, and the deficiency of urinary ingredients.

The Danger of Morphia in Gynæcological Practice. (*British Gynæcological Journal*, May, 1895.) By H. Macnaughton Jones, M.D.

The question of morphia administration in women is considered from the following points of view: the influence of temperament on its action and effects; our knowledge of its physiological and psychical influences; the precautions to be observed in its exhibition.

It has been clearly proved by a number of observers that what we understand by the hysterical temperament occupies the foremost place in the causation of morphiomania. Hysteria, neurasthenia, neuralgia, cephalalgia, ovarian crises, dysmenorrhœa, spinal neuropathies, neuro-mimesis, are the correlated conditions, often associated with sexual disturbances, which stand in the forefront in the etiology of morphia abuse in women. And they are the very conditions for which it is most frequently prescribed. The physical and psychical states associated with pregnancy excite a craving for the effects of morphia and its continued use.

Apart from the narcotic effect of morphia in assuaging pain its effects on a neurotic person may be summarized as follows:

Following the injection there is a period of repose and of pleasurable sensation. The pulse is stronger and the breathing freer. The duration of this period is variable and is diminished as the injections are increased. The periods of depression are then intensified as the quantity of morphia is increased, complete reaction to the previous exhilaration follows, loss of nerve-control takes place, and a craving for the stimulus is again excited. Other troubles associated with morphinism are disorders of digestion and dyspepsia, constipation, vesical irritation, visual disturbances, lessened reflexes; rotary oscillations of the arms, defects of memory and moral perversion, psychical apathy, and interference with the metabolic functions of the liver through its influence on its glycogenic function. But what concerns us more especially is the influence exerted by the morphia habit on the catamenial function,—namely, arrest of the same, constant irregularity or complete suppression which causes sterility. There is also a tendency to abortion and a lowering of the vitality of the embryo.

The moral of this paper is that there is a responsibility attached to the employment of morphia for the relief of pain in the affections of women, not sufficiently recognized in practice. This responsibility imposes on the physician the duty of differentiating those cases in which morphia may almost certainly be given with immunity from its toxic affects, from those in which the risk of intoxication by its repeated use is great. Under no circumstances should the patient be permitted to inject herself, and only under very exceptional circumstances should friends do so.

On the Use of Local Bloodletting in Gynæcological Cases. (*London Medical Times and Hospital Gazette*, July 6, 1895.) By Bedford Fenwick, M.D.

The author believes that local bloodletting is a most important and powerful remedy in certain gynæcological cases. The local abstraction of blood can be attained by using leeches or by scarification. The first method he has used chiefly for external application on the abdomen or around the anus. He considers leeches as objectionable for use on the cervix, not only because they draw very little blood and leave a wound which heals badly in some persons, but because there is danger of their entering the uterus, and they may even pass through the Fallopian tube into the abdominal cavity. Scarification of the cervix is a simple and safe procedure. The following practical points are insisted upon: in long-standing congestion the mucous membrane and its subjacent tissues are almost always hardened and thickened, and the punctures should be made more deeply and more freely than usual to make the blood flow. The knife-edge should be very sharp or the necessary pressure may send the knife deeper than desired. The patient should be warned not to move. The punctures should be confined strictly to the cervix.

Cases are cited which show the relief afforded by this operation. The following conclusions are drawn:

1. That where the cervix uteri is deeply congested, deep red, bluish, or purple in color, local depletion by scarification generally gives immediate relief.

2. That where this congestion is caused and kept up by flexion of the uterus obstructing the return of the venous blood from the cervix, and causing chronic enlargement of the uterine veins generally, local depletion allows a pessary to be inserted with safety and comfort to replace the organ, which almost certainly could not otherwise be tolerated.

3. That in every case, of course, the possibility of the patient being pregnant would be investigated before scarification were attempted.

4. In cases of subacute ovaritis or obscure throbbing pain in the pelvis, cupping or leeching externally frequently relieves the patient immediately.

5. In cases of vaginismus from inflamed hemorrhoids or other rectal congestive conditions, leeches round the anus give rapid relief or cure.

6. That with the precautions I have enumerated scarification is the simplest and safest method of abstracting blood from the cervix, leeches or cupping being kept for external use only.

PATHOLOGY.

IN CHARGE OF ALLEN J. SMITH, A.M., M.D.,

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AND

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The Poisonous Principle of Cholera and its Antitoxin. (*Deutsche medicinische Wochenschrift*, July 18, 1895.) By Behring and Ransom.

Ransom, following out a series of experiments suggested by Behring concludes:

1. It is possible to secure from cholera cultures a fluid which is in the possession of specific poisonous properties.
2. The disease-phenomena which this fluid gives rise to when introduced into a susceptible animal are similar to those which follow the introduction of the living vibrios of cholera.
3. From this fluid there may be obtained a definite, solid body, the action of which is similar to the fluid from which it has been obtained.
4. Animals which are susceptible to cholera can be treated with the cholera poison, which, prepared in the same way as the antitoxic serum of diphtheria, gives a serum which is antidotal both to the cholera poison and to the living cholera organisms.

Formol. (*Bulletin de la Société anatomique*, December, 1894.) By René Marie, M.D.

This author advises for the purpose of hardening nervous tissues that the cord be placed in seven hundred to eight hundred cubic centimetres, and the brain in two litres of a one-per-cent. formol solution for four to five days, when the sections can be prepared. Ranvier's picro-carminic method acts slowly and poorly. The osmic acid and tannin stain of Azoulay gives good results. In order to stain with Weigert's or Pal's methods, the sections are placed for a short time in chromic acid.—*Neurologisches Centralblatt*, May 15, 1895.

Infection by the *Proteus Vulgaris*. (*Société de Biologie, Mercredi Médical*, June 19, 1895.)

Charrin found, in a purulent pleurisy of great severity in a woman who had recently given birth to a child, pure culture of the *proteus vulgaris*.

He considers that it should be classed among the pathogenic microbes, as such properties have been ascribed to it in abscesses, angiocholitis, etc.

Lesions of the Nervous System in Osteitis Deformans, Paget.

MM. Gilles de la Tourette and Marinesco have given to the Société Médicale des Hôpitaux de Paris, June 28, 1895, a report of the involvement of the nervous system in a case of osteitis deformans of Paget. The nerves, especially the sciatic, were considerably increased in volume, due to an interstitial neuritis, probably of vascular origin.

In the cord the lower dorsal region showed a decrease in number of the fibres, in the median portion of the posterior column and in the posterior root zone, with a proliferation of the neuroglia. The anterior and posterior horns, as well as the roots corresponding, were not affected.

A Case of Typhoid Septicæmia associated with Focal Abscesses in the Kidneys, due to the Typhoid Bacillus. (*Journal of Pathology and Bacteriology*, April, 1895.) By Simon Flexner, M.D., of Baltimore.

The distribution of the typhoid bacillus in the body in cases of typhoid fever still presents interesting features. The finding of the typhoid bacillus in the mesenteric glands, spleen, liver, and kidneys, in the bile and bone-marrow, and in the blood of the fœtus, would indicate that it had at some time during the course of the disease been present in the blood-current. The recent contributions to the study of the relation of the typhoid bacillus to local foci of inflammation have tended to show that in a variety of inflammatory processes the typhoid bacillus alone is concerned. The case under consideration presented the clinical features of typhoid fever on first observation; but later certain symptoms intervened which led to a suspicion of cerebro-spinal meningitis. On the day of death a soft swelling, which was not painful, was noticed in the left parotid region. The interest in the autopsy lies in the state of the kidneys, both of which are enlarged and pale, and present numerous whitish nodules, larger than miliary tubercles. These nodules are noticed both beneath the capsule and on cut sections of the organ, and are larger in the right than in the left kidney. Cultures made from these areas show the presence of typhoid bacilli, and this organism may also be demonstrated in the intervening kidney substance. The parotid gland is infiltrated with pus containing streptococcus pyogenes. Typhoid bacilli were subsequently obtained in cultures made from the bile, spleen, mesenteric glands, bone-marrow, lungs, and heart's blood. The presence of typhoid bacilli in these situations is undoubted, and these organisms were differentiated from the bacillus coli communis, which was also present in some of the cultures, by the failure of the former to produce indol in cultures, by their failure to ferment sugar, by their failure to coagulate milk, and by the yielding of an alkaline reaction by their development. Their growth was also observed upon different solid culture media and they were studied microscopically.

A Rapid Method of Making Permanent Specimens from Frozen Sections by the Use of Formalin. (*Johns Hopkins Hospital Bulletin*, April, 1895.) By Thomas S. Cullen, M.B.

The entire process is as follows :

- (a) Place the frozen section in five-per-cent. aqueous solution of formalin for three to five minutes.
- (b) Leave in fifty per cent. alcohol three minutes.
- (c) In absolute alcohol one minute.
- (d) Wash out in water.
- (e) Stain in hæmatoxylin for two minutes.
- (f) Decolorize in acid alcohol.
- (g) Rinse in water.
- (h) Stain with eosin.
- (i) Transfer to ninety-five per cent. alcohol.
- (j) Pass through absolute alcohol, then through either creosote or oil of cloves, and mount in Canada balsam.

By fixing the specimen in formalin before it is frozen the blood may be preserved. This process requires at least two hours. A small piece of the tissue is placed in a ten per cent. solution of formalin and allowed to remain for two or three hours. It is then put on the freezing microtome and cut into thin sections. The great advantage in this method is the prevention of the contraction of the tissues, such as takes place when frozen sections are passed through alcohol.

Bacterial Absorption from Recent Wounds. (*Fortschritte der Medicin*, April 1, 15, and 29, 1895.) By C. Schimmelbush, M.D., and A. Ricker, M.D.

The authors made researches directed towards proving at what period of time organisms could be found in the blood-stream and various viscera.

White mice were inoculated near the tails and were killed at varying periods of infection. The organs were removed with sterilized instruments, chopped up, and portions of them placed in nutrient materials. The organisms present underwent development, and thus gave a measure of the amount of absorption of the microbes. In the first experiment, ten white mice were employed and were inoculated with a spore-containing anthrax culture, the wound involving the skin, deep fascia, and the muscles at the root of the tail. In all but one case organisms were found in the lungs and liver after an interval of half an hour; and in one case they were found in the lungs, liver, and kidneys within that time. Four rabbits were then treated in a similar way by infecting a deep muscular wound; they were killed at varying intervals up to three and a half hours, but in none of them were organisms found in the viscera.

Another set of experiments was undertaken in which the subcutaneous tissues were alone infected. In ten cases an anthrax culture was applied to a subcutaneous wound without touching the skin, the animal being sub-

sequently killed, and the organs examined as before. No organisms were found except after an interval of four hours. After subcutaneous injection of the spores, however, the bacteria were found to be disseminated through the system in two hours.

Further observations were made by implanting portions of the internal organs of an anthrax-infected mouse in the bodies of other mice, and noting the progress of infection at varying intervals. After one hour and a half, no result followed, except in a few cases where suppurative organisms had also gained entrance; but after two hours and three-quarters, three, and five hours, anthrax bacilli were always found, although the clinical course of the case was considerably modified, owing probably to the bacilli being enclosed in the ingrafted tissue. Finally, experiments were made with a number of different forms of bacteria, in order to ascertain whether the nature or the size of the organisms had any influence on the rapidity of absorption, but in every case there was very rapid absorption of the microbes.

Bacteria are thus proved to follow the course which is taken by such bodies as Indian ink or globules of fat. Lymphatic absorption of bacteria has long been recognized; now we have it authoritatively shown that they are also disseminated actively along the blood-vessels.—*London Practitioner*, June, 1895.

Modern Difficulties in Bacteriological Diagnosis. (*Montreal Medical Journal*, November, 1894.) By J. G. Adami, M.A., M.D., M.R.C.S., of Montreal.

At a time when bacteriology has made an ample apology for its existence, it is well that one of us should pause and, as a bacteriologist, point out that matters are not quite so surely established as in the opinion of very many it would seem to be. The main problem before us at the present time is in relation to the determination of species. Take, for instance, the typhoid bacillus. If we examine the stools of a patient supposed to be affected by the disease, we may, among crowds of colonies presenting but a slight divergence from the characters usually regarded as typical of the bacillus, find some few colonies only distinguishable by the most delicate tests, but still not quite conforming to the type, and the question is, Are these colonies truly those of the typhoid bacillus, or do they represent some closely allied species? The same is true of the bacillus of cholera, of diphtheria, of pyæmia, and of pneumonia. The best field for establishing the laws of grouping is to be found in a study of the innumerable, slightly varying forms discoverable in ordinary water. Let a series of laboratories work out each one a group of microbes; one laboratory taking those producing green pigmentation, another the red pigment bacteria, and a third the bacillus coli communis, with all its varieties found in contaminated water. By this means working out a very large number of cultures, isolated from regions all over the continent, the points of resemblance and of divergence of these

cultures will best be determined. Only by this method can we establish rules of guidance to lead us out of our present difficulty.

Notes on Certain Forms of Peripheral Lesion in Infantile Paralysis. (*Canadian Practitioner*, February, 1895.) By A. Primrose, M.B., C.M. (Edin.), of Toronto.

The following peripheral lesions were found in a "dangle-leg," which had been amputated from a boy, aged thirteen, who had suffered from infantile paralysis. The muscle was very much wasted, and almost wholly represented by fibrous tissue. There was little or no fat in the substance of the muscles, and a remarkably small quantity between the muscles. The subcutaneous fat, however, was very abundant. This subcutaneous fat is probably not so much the result of an undue development as it is of a failure to atrophy. The presence of this fat produces the condition which prevents one from pinching up the skin and separating it from the subjacent structures. It would also seem to indicate that the trophic nerves to the skin lie in the posterior nerve-roots. There is a very definite atrophy in the nerves distributed to the parts, the vessels are much diminished in size, and the bone is much smaller than that in the healthy leg. In a second case, the patient, a boy, aged nine, presented hemiatrophy of the tongue with no other pathological lesion indicated. The condition is looked upon as the result of infantile paralysis affecting the left hypoglossal nerve-roots.

Pathogenesis of Simple Gastric and Duodenal Ulcers. (*Canadian Practitioner*, February, 1895.) By W. J. Greig, B.A., L.R.C.P. (Lond.), of Toronto.

Both gastric and duodenal ulcers are peptic in origin,—that is, they are produced by the action of the gastric juice on the mucous membrane. There are other factors concerned in the production of these ulcers, however, conditions which impair the integrity of the mucous membrane and allow the acid gastric juice to act upon it. Among these conditions may be mentioned traumatisms, occurring in patients whose resistance has been lowered by anæmia. A chronic condition of malnutrition of the mucous membrane, which is due to thrombosis rather than to embolism, is also an etiological factor. Hyperacidity of the gastric juice is as liable to be the result of as the cause of the condition. Ulcers of the duodenum following burns are septic in origin, and are the result of the action of the gastric juice on devitalized tissue.

The Effect of Inhalation of Oxygen upon the Hæmoglobin. (*Journal of the American Medical Association*, June 15, 1895.) By George J. Preston, M.D.

The investigation was undertaken for the purpose of finding whether or not there was any scientific basis for the many claims made for the therapeutic use of oxygen. Inhalations of pure oxygen under normal temperature and pressure cause a diminution in the number of respirations. Does

the blood become more highly oxygenated than it does when ordinary air is breathed? The capacity of serum for taking up oxygen is about the same as that of distilled water, and can be increased, under pressure, in the same manner. Experiments upon a solution of hæmoglobin show that, if a sufficient quantity of oxygen is present, each grain of the solution will take up 1.59 cubic centimetres. If there is an insufficient quantity, the hæmoglobin will not be completely satisfied. The experiments made bear upon this point. Animals were placed under a glass jar which was first filled with pure oxygen which had been washed several times, and a stream of the gas was allowed to pass into the jar from a cylinder. A sufficient quantity of caustic potash was kept in the jar to absorb all the carbonic acid. The hæmoglobin was measured by the hæmoglobinometer of Fleischl, before and after the experiments. Of seven experiments, six upon rabbits and one upon a white rat, there were two that did not show diminution in the number of respirations and rise in the percentage of hæmoglobin. Of the two failures, one was not kept in the oxygen long enough, and the other, through the exhaustion of the oxygen in the cylinder, was breathing practically atmospheric air towards the close of the experiment. In the eighth experiment, oxygen was injected into the rectum of a small dog for forty minutes. Respirations fell from 24 to 10; hæmoglobin rose from 82 to 84. Experiments on four healthy men gave the following results: Experiment 9: weight, one hundred and forty pounds; inhaled oxygen for seven minutes; hæmoglobin estimated before inhalation, 82; after, 92. Experiment 10: weight, one hundred and sixty pounds; time of inhalation, five minutes; hæmoglobin, before, 78; after, 87. Experiment 11: weight, one hundred and fifty pounds; time of inhalation, six minutes; hæmoglobin estimated before inhalation, 76; after, 83. Experiment 12: weight, one hundred and ninety pounds; inhaled oxygen five minutes; hæmoglobin estimated before inhalation, 80; after 95.

This increase in the percentage of hæmoglobin in the blood seems to be brought about by the presence of an excess of oxygen, by which all the hæmoglobin is satisfied. These few experiments, showing that the percentage of hæmoglobin in the blood can be largely increased by the inhalation of pure oxygen, justify its full and scientific trial in diseases obstructing the air-passages, and it might give good results in the treatment of certain forms of anæmia.

A Specific Reaction for Tuberculous Sputum. (*Aerzt. Rundsch.*, 1895, No. 6.) By Roerig, M.D.

This test depends upon the inverting power of tuberculous sputum, by which starch is changed to sugar. Healthy lung tissue destroys a small amount of starch, but does not change it into sugar. The inverting substance can be extracted with water; another substance is obtained which, when boiled with dilute sulphuric acid, reduces Fehling's solution. This substance seems to be analogous to the glucosides.

The test is made as follows: To thirty grammes of the sputum containing the tubercle bacilli thirty grammes of distilled water and one gramme of boiled starch are added. The mixture is shaken, placed upon a water-bath at 37° C., and allowed to remain several hours, or until it is evaporated to the consistency of a stiff paste. It is then tested for starch by adding a solution of iodine to a small quantity of the mixture. No blue color appears. Fehling's solution shows the presence of sugar.

Some of the cold mixture is then added to two cubic centimetres of sulphuric acid in a test-tube. A violet ring forms at the point of contact in a few minutes, and on shaking the test-tube the violet color is diffused throughout the acid. It becomes more intense on standing, and remains unaltered for several days. The reaction is more decided if a little sodium carbonate is added to the mixture.

This reaction, the author thinks, occurs only in sputum containing the tubercle bacilli, and the inverting power varies in different specimens obtained from patients in advanced stages of phthisis. The violet color can also be obtained from pure cultures of tubercle bacilli.

MISCELLANEOUS.

The Water-Supply of Philadelphia and Camden.¹ By Joseph Wharton.

It has come to be generally understood that something must be done about our municipal water-supply. For some years, despite great improvement in pumps and reservoirs and mains, the feeling has gained ground that the water is foul, disgusting, and pestiferous, and that it grows worse year by year. The Schuylkill River was originally a pure mountain stream, flowing through forests and over rocks, and its water was perfectly satisfactory. But towns grew along its banks and coal-mines were opened, so that the river became a mere sewer for a great population, besides having to carry the poisonous water of the mines and the black refuse of the coal-heaps. Large factories added their dye-stuffs and chemicals, and well-filled cemeteries contributed their drainage. The water of the Delaware River, near to Philadelphia, is worse than that of the Schuylkill, and is no longer distributed through the water-mains. The two rivers unite four miles south of Market Street and form a great tidal pool, having, except at times of flood, a very gentle movement towards the sea. This pool receives the excreta of more than a million persons, many of them diseased, besides that of a vast number of horses, cattle, and other animals, and the discharges of countless factories. The proportion of sewage to that of comparatively good up-river water in this tidal pool is as one to twelve. At this point

¹ Pamphlet published in Philadelphia, May, 1895.

we are met by the contention that, no matter how foul with sewage nor how poisonous with germs river water may be, it becomes perfectly sweet, innocent, and wholesome when it trickles through a few inches of sand. The sober judgment of nearly all the important authorities upon water-supply for cities is, however, distinctly to the effect that water contaminated by sewage can never be made wholesome by filtration, and that water into which sewage has entered should never be used for drinking, no matter how filtered. There are at present five sources from which Philadelphia can draw a water-supply : Lake Erie, the upper Susquehanna, the Delaware above Easton, the Perkiomen and Tohickon, and the sand and gravel rivers of Southern New Jersey. Among these sources, Lake Erie only can afford water permanently good without filtering ; but the engineering difficulties would require a sum of money and a length of time for construction quite beyond the present views of our citizens. The upper Susquehanna appears too distant. The upper Delaware may prove scanty in after years, and though now good enough for drinking is sure to grow worse. Further, it cannot be protected from pollution by any legislation of this State, since all its upper tributaries lie in the State of New York, and all its lower course is bounded on one side by the State of New Jersey. The Perkiomen and Tohickon are totally inadequate to yield a sufficient supply, and filtering would ultimately be necessary. The analysis of the Southern New Jersey rivers gives the following parts per 100,000 : total solids, 4.06 ; inorganic salts, 2.05 ; volatile organic matter, 2.01 ; chlorine, .06 ; hardness, 1.44. The water of these streams is always clear, their flow is much more uniform than that of upland streams. The water has a brownish tinge, due to the cedar swamps through which they flow, and this would be obviated by clearing away the swamps to make room for the storage reservoirs, the bottoms of which will be clean sand and gravel. The streams flow slowly ; but more stir and aëration would be supplied by the pumping required. The project is to dam at or near the head of the tide the several streams forming the Mullica River ; to gather their waters by back-flow into a reservoir at the village of Atsion ; thence to force them farther up stream into a reservoir, having an elevation of seventy feet above the tide ; thence to let them flow by gravity through a canal to a reservoir, Haddon Reservoir, at an elevation of sixty-one feet, to be formed by damming the north branch of Cooper's Creek ; from the lower or western end of this latter reservoir, the water is to flow through a masonry conduit thirty-one thousand feet long and through three thousand feet of steel pipes to the bank of the Delaware River, under which it is to pass by one or more steel-lined tunnels to a point in Philadelphia near the existing Frankford Pumping Station. It would then have a pressure of about forty-six feet, which would carry it to the several pumping stations in Philadelphia, from whence it could be lifted into the several distributing reservoirs. From Haddon Reservoir a sufficient quantity of water would flow through steel pipes to a distributing reservoir for the supply of Camden. By this project three

hundred million gallons of water can be supplied daily to Philadelphia and Camden at a total cost of about fifteen million dollars.

"Cancer-Houses." (*Provincial Medical Journal*, June 1, 1895.)
By A. Haviland, M.R.C.S., England.

This writer believes that soil and situation have much to do with the mortality from cancer, and his well-known collection of statistics in England and Wales shows that "cancer is most prevalent along the courses of rivers which seasonally flood their banks, and especially where, from the flatness of the country, the floods are retained." In this article he gives a series of cases cited by T. Law. Webb, in his paper on the etiology of cancer, who suggests that there are "cancer-houses" and "cancerous water or water-supplies," as well as "cancer-fields." In two houses under one roof, with a drain system and water-supply common to both, six people died of cancer in twenty-six years. In house No. 1 a man, twenty-eight years of age, died of cancer of the rectum. The house was then occupied by a man and his wife. The man died of cancer of the stomach about two years after the death of the first tenant, and ten years later his widow died of cancer of the rectum. In No. 2, at about the same time, a woman died of cancer of the breast. No. 1 was occupied later by three maiden ladies. Of these one died four years ago of cancer of the uterus, a second died last winter with all the symptoms of cancer of the stomach, and the third still survives.

In a group of twenty cottages nine cases of cancer occurred in fifteen years. All of the inhabitants use water from a certain pump by the roadside, close to a filthy hovel. One cottage furnished three of the nine cases. None of the nine people were of kin, and in no instance was there a family history of a malignant disease.

In Case 8 of the series a pattern-maker died in 1875 from cancer of the rectum, his wife died also from cancer of the rectum in 1884, and a daughter died from cancer of the breast in 1888. Drinking-water was obtained from a pump a few yards from a cesspool. In the series of ten "cancer-houses" there was a history of polluted water-supply in every instance, and of the thirty-one patients who died from cancer in these houses, in fifteen the lesion was in some portion of the alimentary tract.

The writer, while investigating the catchment basin of the river Wey in the Farnham district of the Thames basin, found one of these "cancer-houses," situated about twenty feet above the stream, in a damp sodden soil. A man aged sixty-eight, who had contracted an epithelioma of the lip while living in this house, said that his grandmother died of cancer there, then her son, and thirdly her grandson, all of whom had been operated on. He was then taken with the disease, and moved from his native hollow to one on the opposite side of the ridge, where he died last summer. Dr. Fressinger of France has reported the occurrence of a veritable epidemic of cancerous disease in a group of three houses at Oyonnax,

where four cases of cancer came under his personal observation in the space of four years. In all four patients the affections could apparently be traced to contamination with the dressings from a case of scirrhus of the breast.

Unilateral Excision of the Tongue for Cancer.—Dr. George Buchanan, of Glasgow, reports on the state of a patient thirty years after excision of one lateral half of the tongue for cancer. The operation is not advised unless the disease is limited to one side of the anterior half of the tongue and has not yet invaded the loose mucous tissue in the floor of the mouth.—*Edinburgh Medical Journal*, March, 1895.

The Work of the Sanitary Engineer in Time of Epidemics, in Time of War, and in Sudden Calamities in Civic Life. (*Sanitarian*, June, 1895.) By William Paul Gerhard, C.E.

When an epidemic threatens, the work of the sanitary and municipal engineer consists principally and first of all in measures of prevention. The problems arising in such a case demand the stricter and closer attention to the sanitation of the soil, the air, the water, the food-supply, and the dwellings of a city. In case an epidemic actually breaks out the duties of the sanitary engineer embrace, first, measures for the protection of those who are not sick, preservation of the purity of the drinking-water, watching the ice supply, flushing and ventilating the city sewers, preservation of the cleanliness of the streets and public urinals, closing of public buildings, and the disinfection of clothing. Second, measures for the proper care of the sick: first, in order not to endanger those who have escaped the scourge; and, second, to cure those who have succumbed to it. Third, measures for the prompt and safe removal and disposal of the dead; this is best done by cremation. The physician and sanitary engineer should work hand in hand at these times. In case of an outbreak of war, the sanitary engineer should attend first to providing proper facilities for the temporary housing of soldiers and to selecting proper sites for military camps. Second, he should attend to the enforcement of cleanliness in the camp; to the examination of the sources of water-supply; to the purification of water and to the provision of an ample supply for the troops and horses; to the drainage of the camp and the removal of waste and garbage; to the erection of latrines, and to safety measures against fire. Third, he should attend to the provision and transportation of a proper food-supply. Fourth, he should attend to the first aid to the wounded on the battle-field and at the dressing stations. Fifth, he should attend to the care of the wounded; the erection and fitting up of temporary field hospitals and means for heating, ventilating, and electric lighting; transportation of the wounded from the battle-field; and the organization of a field ambulance service. Sixth, he should attend to the care of the sick in tent or barrack hospitals. Seventh, he should attend to the sanitation of the battle-field and to the care of dead soldiers; the cleaning and disinfection of camps, the destruction of tempo-

rary hospitals, and the disinfection of putrefying battle-fields. Many opportunities offer themselves to the sanitary engineer after sudden calamities, catastrophes, and great disasters in civic life. In order to make the most of his opportunities and to render injured persons as comfortable as possible until medical aid arrives, the engineer should know the rudiments of the anatomy and the physiology of the human body, and should be conversant with the principles of the first aid to the injured.

Infectious Diseases in Public Schools. (*Sanitarian*, June, 1895.)
By Moreau Morris, M.D., of New York.

School congregations of youthful victims present fruitful fields for the development and dissemination of pathogenic germs, and epidemics of alarming proportions are apt to arise after the introduction of such germs into such a community. Preventive measures are a public necessity, and physicians and health officers are directly responsible for their promulgation and exercise. To neglect this obvious duty seems almost criminal. Among the sources of infection and contagion may be mentioned the covering of school-books with muslin, cloth, or paper; the indiscriminate use of slates, slate-pencils, lead-pencils, and pen-holders during the day, and their distribution on the following day with no attempt at cleansing; the habits of pupils of erasing slate-pencil marks with fingers wet with saliva, and of moistening the tip of the lead-pencil with saliva before using it; the storage of outer garments in closets in the class-room where they are hung in mass. As precautions may be mentioned,—

1. The great importance of the early and prompt reporting of any contagious disease, occurring in the practice or in the knowledge of any physician, to the Health Department.

2. The medical profession, so far as it is possible in their family intercourse, should impress upon the minds of their patrons the fact of the communicability of any contagious disease, however mild may be its manifestations.

3. The Board of Education should be induced to adopt suggestions relating to the care of books, slates, slate-pencils, pads, lead-pencils, and outer clothing during school sessions.

4. Children coming from infected premises should be excluded from school until thorough disinfection has been performed.

Disinfection of Tubercle-Infected Houses. (*British Medical Journal*, February 16, 1895.) By Sheridan Delépine, M.B., and Arthur Ransome, M.D., both of Manchester, England.

Since the preliminary report upon this subject was published in the November 4, 1893, issue of the *British Medical Journal*, the inquiry has been extended to other methods of disinfection, and the influence of certain natural agents on the virulence of the *bacillus tuberculosis*. Their conclusions are: 1. The disinfection of rooms which have been contaminated

with tuberculous products cannot be obtained by means of the fumigation methods such as are generally used at present. Sulphurous acid, chlorine, and euehlorine, as used under supervision by experienced municipal disinfectors, have proved practically useless. This only confirms the results obtained by Koch and his pupils in the case of a number of other organisms. 2. The only other method of disinfection which seemed to promise more satisfactory results was the direct application of a solution of chlorinated lime to the walls to be disinfected. This method has given, so far, satisfactory results, but it is attended with discomfort on the part of those who have to carry out the disinfection, though this difficulty can no doubt be overcome. It must be remembered that the experiments of Schill and Fischer are unfavorable to the use of perchloride of mercury. 3. Light is, in the case of the tubercle bacillus, as it has been proved by several observers to be in the case of other organisms, the most important natural agent.

Idiot Skulls.—Sir George Humphrey has examined nineteen specimens of idiot skulls, and finds nothing to suggest that the deficiency in the development of the skull was the leading feature in the deformity, and that the smallness of the bony cerebral envelope exerted a depressing or dwarfing influence upon the brain, or anything to give encouragement to the practice lately adopted, in some instances, of the removal of a part of the bony case, with the idea of affording more space and freedom for the growth of the brain. —*Lancet*, February 16, 1895.

FORENSIC MEDICINE.

IN CHARGE OF LORENZO D. BULETTE,
Of the Philadelphia Bar.

LIABILITY OF HUSBAND FOR MEDICAL SERVICES TO HIS WIFE LIVING APART FROM HIM BY AGREEMENT.

THE law is settled that a husband must provide his wife with necessities, in which category are included medicines and medical services. But, where a husband and wife were living apart under an agreement the terms of which required him to pay her fifty dollars a month for her support, and a physician, who had no knowledge of such an agreement or that they were thus living apart, rendered medical services to the wife at her request, sufficient doubt was created as to the liability of the husband in such case as to render it desirable to have the opinion of the Supreme Court thereon.

The action¹ was brought by the physician against the husband to recover compensation for medical services rendered to the defendant's wife at her request. The trial court, on the evidence submitted, instructed the jury to find for the defendant. To this instruction the plaintiff excepted; and, on appeal, the following facts appeared in the certificate.

"Is a husband liable for medical services rendered by a third person to his wife at his wife's request, where the husband and wife have, previous to the rendering of said services, entered into a contract whereby the husband agrees to pay his wife fifty dollars per month for her support and maintenance and all family expenses, where the husband and wife, by mutual agreement, are living separate and apart, and where said amount is fully paid by her husband."

To this the Supreme Court said, "It is not questioned but that, in the absence of the agreement between the defendant and his wife, the defendant would be liable for the services sued for. The defendant and his wife were, by mutual agreement, living apart, and, while so living, agree that the defendant shall pay, and that she will receive, fifty dollars per month for her support and maintenance and family expenses. The plaintiff, without, so far as the certificate shows, any knowledge that they were living apart, or of said agreement, rendered medical services to the wife at her request. Conceding that the agreement was valid and binding between the defendant and his wife, it certainly was not as to the plaintiff, under the facts presented in the certificate. It may be said that we should look to the facts proven to see what questions are involved, but not so. We look to the record to see that the questions certified are involved, but not for the questions not certified. Whether or not the plaintiff would be bound by the contract between the defendant and his wife if he knew thereof before rendering his services, or by notice from the defendant that he would not be responsible for bills incurred by his wife, we do not determine, as that question is not certified for our determination. Our conclusion is that the question must be answered in the affirmative."

BOOK REVIEWS.

THE YEAR-BOOK OF TREATMENT. A Critical Review for Practitioners of Medicine and Surgery. Philadelphia: Lea Brothers & Co., 1895.

The eleventh issue of the "Year-Book of Treatment" scarcely calls for commendation on our part. Our review of each previous year is entirely applicable to this number. It is well known by the majority of busy practitioners, and has long been considered one of the best compilations of medical progress in regard to the treatment of disease.

A. W. P.

¹ *Lawrence vs. Brown*, 59 N. W. Rep. 256.

A TREATISE ON THE NERVOUS DISEASES OF CHILDREN, for Physicians and Students. By B. Sachs, M.D., Professor of Mental and Nervous Diseases in the New York Polyclinic; Consulting Neurologist to the Mt. Sinai Hospital; Neurologist to the Montefiore Home for Chronic Invalids; Ex-President of the American Neurological Association. One volume, 688 pages, 8vo, illustrated by 169 engravings in black and color, and a colored plate. Muslin, \$5.00.

In this handsome volume we find an admirable addition to the growing list of treatises on nervous diseases by American authors. Dr. Sachs is, however, a thorough master of the German language and literature, and is thereby unusually fitted for the production of a work which in these times and in this particular field demands, in addition to a broad experience, wide reading. The bibliographical list which is appended to every chapter is an evidence of the author's conscientious study of the latest neurological literature, to which American writers have contributed no small part.

The style is clear and positive; the clinical descriptions and anatomic and physiologic intricacies are made plain by well-executed illustrations taken from the author's practice and from the most recent works. In these and other features the author has been helped by Drs. Joseph Collins and Alfred Wiener, to whom due credit is given. In the chapter on methods of examination, the author wisely says that the physician should train his powers of observation, so that by the recognition of the peculiarities of facial expression, of gait and stature, by the inspection of muscles, of deformities, and the like, he can at least suspect the trouble without putting a finger to the body. A good observer will thus succeed far better than the man who can never even suspect a disease, unless he has all his tools (percussion-hammer, thermometer, aësthesiometer, electrodes) constantly at his command. On the other hand, he warns against making a diagnosis unless the child has been wholly undressed, and one remembers that the patient has heart and lungs, liver, spleen, and intestines which, if diseased, may hold an important relation to the nervous disorder present. Among the valuable tables is one which shows the cranial measurements in children, at different ages, with illustrations by Benedict and Peterson. In the section on general diseases, epilepsy is discussed on the recognized theory that the attack is due to overaction of the cortical cells; that the bromides increase the stability of their resistance, and that we have no drugs that can in any sense be considered proper substitutes for them. Dr. Sachs does not believe in Erlenmeyer's claim that the combination of three salts acts better than the use of one alone. He favors Dr. Seguin's plan of giving bromides after the manner of giving quinine in malaria,—namely, by giving little in the interval, but by increasing the dose very much at the time when an attack is expected, or if the attacks are frequently repeated, to give the drug four or five hours prior to the time at which the seizures occur. Next to bromides *cannabis indica* is recommended and the regulation of diet enjoined. Albuminoids are allowed in small quantity with a limitation of the cereals. The surgical treatment of the eye-muscles for the cure of this disease is condemned.

As to chorea, the author believes that in its causation there is an undoubted seasonal influence, but that the recurrence of rainy and cloudy days and the frequent passage of storm centres are of more importance in bringing about a recurrence of attacks than in giving the first impetus to the disease. He is not convinced that nasal or ocular trouble, of which so much has been made of late, ever leads to true chorea. Rest in bed with an easily digestible diet he believes to be more efficacious than medicinal treatment, of which he says, "If one must use any drug in the cases of chorea, arsenic is to be preferred."

The chapters on the anatomy and physiology of the brain and spinal cord have been very carefully prepared. Dr. Starr has furnished the author with his table on spinal localization revised with additions and corrections up to date. A fine ex-

ample of the author's clear and instructive style is his description of speech defects, —sensory and motor aphasia. He shows that in children the blood-supply of the brain is quite different from that in the adult. Instead of hemorrhage occurring most frequently in the vicinity of the internal capsule and in the distribution of the middle cerebral artery, in the child this region is less frequently affected, by far the larger number of accidents occurring in the domain of cortical and pial vessels.

Dr. Sachs shows that little is to be expected in children from medicinal or surgical treatment in cases of cerebral tumor. Children tolerate operations upon the head very poorly, indeed. One great difficulty is that no matter how well we may locate the growth we can form no estimate of its size. In early life such tumors are frequently tubercular, and, of course, on that account the outlook is discouraging. A chapter on diseases of the mind closes this very interesting work. Some of the terms used vary somewhat from the usual forms, as, for example, morphium, myelosyringosis, paramyoclonia, and cornu amonis, but the typography is remarkably free from errors, and the type large and clear.

G. H.

REMOTE CONSEQUENCES OF INJURIES OF THE NERVES, AND THEIR TREATMENT.

An Examination of the Present Condition of Wounds received in 1863-65, with Additional Illustrative Cases. By John K. Mitchell, M.D., Assistant Physician to the Orthopædic Hospital and Infirmary for Nervous Diseases, Philadelphia; Lecturer on Physical Diagnosis in the University of Pennsylvania. 12mo. 233 pages, with 12 illustrations. Cloth, \$1.75. Philadelphia: Lea Brothers & Co.

The appearance of this work is a remarkable and gratifying proof that after thirty years the wealth of pathological material of the Civil War is yet available for clinical instruction. It is not likely that there will ever be gathered together again, in this country, the class of cases that were treated in the United States Army Hospitals at Christian Street and Turner's Lane, in Philadelphia. Aside from the remote possibility of actual warfare our own troops and those of the principal nations are equipped with weapons entirely different from those employed thirty years ago. With rifles of small calibre and the jacketed projectiles which penetrate without crushing and tearing the limb, the aspect of military surgery will soon have entirely changed. The author of this book has added greatly to its value and interest by supplementing the histories of wounded soldiers with those of eighteen cases of nerve injury occurring in civil life. The reader cannot fail to be impressed with the care and persistence with which all these cases have been studied, and practitioners will find the general chapters which follow full of interest and of valuable suggestions in the line of treatment.

The author does not believe in the possibility of primary or immediate union "by first intention" in nerves sutured directly after section, claiming that the evidence adduced for the very early passage of nerve influence does not bear close examination. Much of the discrepancy of views on this point is no doubt due to the difference of the subjects. Dr. Mitchell shows that even the physiological experimenter upon nerve sections, who has everything in his favor, having the control of the extent and the character of the injury entirely in his hands, has not yet even secured undoubted primary union. Accordingly, in a case of traumatic neuritis following a stab-wound of the ulnar nerve, for the relief of which the nerve was divided above the elbow, he remarks, "So good a restoration so soon (three months) is rare in the history of nerve wounds, especially when no suture is applied." In this position the author is supported by all the latest investigations. The publications of Howell and Huber, Willard and others show that primary and absolute union of a nerve without degeneration of the peripheral end does not occur; immediate and rapid return of function, however, has been often demonstrated, and is undeniable. Whether this immediate return is through direct transmission across the minimum amount of space, or whether the restoration of the parts to their normal positions in

some way assists other trunks in taking up the function of the injured nerve, is still uncertain.

An interesting feature of some of the records is the misreference of touch-sensation. A patient may refer touches upon his fingers to a point some distance upward,—for instance, mistaking contact with a finger-tip for a touch at the elbow or wrist. The fact that in almost every case of this kind the contact is perceived as if nearer the trunk than its real point would be a point in evidence that regeneration of the nerve progresses centrifugally. This phenomenon is the subject of some interesting letters by Professor Hugo Munsterberg, of Harvard, and Professor W. H. Howell, of Johns Hopkins University. G. H.

DOSE-BOOK AND MANUAL OF PRESCRIPTION-WRITING, with a List of the Official Drugs and Preparations, and also many of the Newer Remedies now frequently used, with their Doses. By E. Q. Thorton, M.D., Ph.G., Demonstrator of Therapeutics, Jefferson Medical College. Philadelphia: W. B. Saunders, 1895. Pp. 5-334. Price, \$1.25.

This small manual has been prepared especially for the use of students, and as a book of reference for the younger members of the profession who may not be conversant with all the facts and small details necessary for correct prescription-writing.

The opening chapter deals with weights and measures, compares the apothecaries' system with the metric, which seems destined at an early date to supersede it, and gives an unusually full table of equivalent weights in both systems, which as a convenient reference will prove very useful. The second chapter is devoted to the details of prescription-writing. The construction of a correctly-written prescription is explained fully, and to this is added a brief consideration of the necessary amount of Latin grammar, and a long list of the more important Latin words showing their terminations and declensions. The subject of incompatibilities is then discussed in all its aspects. In the third chapter the various classes of official preparation are considered, and examples given as to the correct method of prescribing them. The fourth chapter treats of dosage, and the various methods of administering medicines. Many illustrations add to the value of this part of the work. The book closes with a list of the principal preparation of the official drugs and their doses, along with some of the newer and still unofficial remedies.

We can testify to the care with which this little book has been compiled, and can cordially recommend it, not only to students, but to practitioners generally who desire to improve the character of their prescription-writing.

A. D. B.

NOTE TO CONTRIBUTORS.

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ORIGINAL COMMUNICATIONS.

MEDICINE AND SURGERY AMONG THE AUSTRALIAN ABORIGINES.

BY J. STEELE ROBERTSON,

Secretary of the Medical School, University of Melbourne, Australia.

UNTIL the arrival of white men in Australia the natives were decidedly a healthy people, but ever since the first shipload of white settlers landed, in 1788, their health has deteriorated very much and their numbers have rapidly decreased. This deterioration and decrease must be laid at the white man's door, for they are wholly due to his interference with the native tribes. He has introduced those devastating scourges, small-pox, syphilis, and intemperance, with the evils they invariably bring in their train; and probably, also, he has brought with him measles and scarlet fever.

The true nature of a "dispersal" may be gathered from the following. The invading settler locates his stock in some district previously in the sole possession of a tribe. The natives soon see their usual food—roots, seeds, and game—quickly disappear before the squatter and his stock. Impelled both by hunger and revenge, they spear some cattle for food, or, perhaps, while searching for food, some cattle are frightened by them, run away, and are lost. In return for this the settler and his men shoot some natives, who in their turn spear a shepherd or stockrider. The squatter applies to the government for police aid, and half a dozen native police are sent up under a European subinspector.¹

¹ "So much do the blood-thirsty proclivities of the natives increase by this sort of work, carried on from week to week, that their officers are afraid, as a rule, to ride before their men on the march, lest any whim might lead to their being shot down."
—CURR: *The Australian Race*, vol. i. p. 102.

Every native has an intense hatred for every one of his own color who does not belong to his own tribe or the tribes with which he is acquainted, and the police department takes advantage of this, and always sends native police recruited from tribes far from the scene of action. Well mounted, well armed, well supplied with ball-cartridges, the black troopers, hot for blood, are put on the trail. Then follow tracking, surprise, and shooting from beyond spear range, which result in the death of many men, the capture of the women, the gratification of savage lust, and a report from the subinspector to head-quarters that the offending tribe has been "dispersed." After several such experiences, and most of the young men have been butchered, the demoralized natives realize the impossibility of winning in the unequal fray, and the tribe—or rather its remnants—are allowed to "come in" to the settlers' homestead, and the struggle is over. In the end syphilis finishes what the rifle began. To what an extent this has happened may perhaps be realized when it is stated that the last Tasmanian died in 1876, and that in Victoria the few natives still remaining are at the government aboriginal stations, while the "dispersal" process is still going on in other Australian colonies.

DISEASES OF THE ABORIGINES.

The ailments which have been observed among the aborigines are, in alphabetical order, ague, apoplexy, asthma, boils, bronchitis, cancer, cataract, cholic, colds, diarrhœa, diseases of the stomach and intestines, dropsy, dysentary, dyspepsia, ear-diseases, epilepsy, fever, fistula in ano, heart-disease, hydatids, hydrocephalus, hydrothorax, influenza, insanity, intemperance, kidney-disease, leprosy, liver complaint, malaria, measles, neuralgia, nostalgia, ophthalmia, paralysis, phthisis, pleurisy, pneumonia, rheumatism, scarlatina, scrofula, scurvy, skin-diseases (such as favus, impetigo, itch, mange, porrigo, ringworm), small-pox, sore throat, syphilis, tabes mesenterica, tuberculosis, and toothache.

The most fatal of all these to the blacks are those introduced by the white man,—viz., epidemic small-pox, measles, and scarlet fever, also the non-epidemic, but not less deadly, syphilis and intemperance. The wearing of clothes, too, during the day (they always take them off at night) has caused a great extension of chest-diseases and of tuberculosis. "In infancy," says the Rev. George Taplin, "the tuberculous diathesis shows itself frequently in the form of hydrocephalus; in childhood it very often manifests itself in tabes mesenterica; later it often appears in the form of induration and ulceration of the glands of the neck, and in this form is generally cured, the person becoming healthy afterwards; but its most frequent and most fatal form is that of tubercular consumption. Any accident to the chest seems to lead to the deposition of tubercle."

Proximity to the towns leads to intemperance, and intercourse with the whites to venereal diseases. Farm- or town-life often brings on nostalgia or home-sickness, which causes the patient to mope, and if, while in this

state, he catches even a slight cold, lung-disease develops and death follows. In nostalgia, cod-liver oil and cantharides have been found useful. Leprosy, again, has been introduced by the Chinese, Japanese, Malays, Afghans, and other Asiatic races, and also by the South Sea Islanders on the sugar plantations.

INTRODUCTION OF SMALL-POX.

The history of small-pox in Australia is not without interest. Dampier, keen observer though he was, saw no poek-marked natives on his visit in 1698. Neither did Captain Cook during his stay at Botany Bay in 1770. Yet in the parts they visited poek-marked old men have been common for decades. The next arrivals in Australia were the first convicts, who reached Botany Bay in January, 1788, and left for Port Jackson, now Sydney Harbor, a few days later. As the English left the bay, two French ships under de la Perouse sailed in and remained in the bay till March 10.

In April, 1789, fifteen months after the arrival of the English ships, and thirteen months after the departure of the French vessels, a violent epidemic resembling small-pox mowed down the natives as corn is mowed by the scythe. Many denied that it was small-pox, on the grounds that had it been such it would have become epidemic among the whites, who tended and fed the sick; that when whites were attacked the contagion did not spread among the settlers, and that the wild dogs who devoured the abandoned corpses of the natives came to no harm. Those, on the other hand, who considered it small-pox pointed out that the whites were mostly inoculated; that in two cases the disease had attacked whole families of whites; that the symptoms and after pitting were the same as those of small-pox; that those who were already inoculated were not attacked, and that immediate inoculation modified very much the severity of the attack.

The small-pox party having gained the day, the English settlers patriotically laid the blame of its introduction on the ships of de la Perouse. But E. M. Curr, in his work, "The Australian Race" (1886), proved beyond a doubt that there was small-pox on board of the transport "Alexander," one of the ships of the first English fleet, and that, on landing, clothes from the men on the ships had been given to the natives; so the blame for its introduction on the east coast lies with the English. On the north and northwest coasts, however, it was undoubtedly introduced by Malay pearl and trepang fishers. Confirmation of these facts is found in the traditions of the aborigines, those of Central Australia averring that the disease came from the eastward, those near Adelaide declaring that it came to them down the Murray River, and those of West Australia affirming that it came from the northward.¹

¹ Further confirmation is found in the fact that in the subdialects of a group of related tribes the words denoting small-pox are generally quite different, or else there is no special word at all, that for "nasty" or "poisonous" being pressed into service. Compare newspaperese "loathsome disease" = syphilis.—J. S. R.

SPREAD OF SYPHILIS.

The rapid spread of syphilis may be attributed to many causes, such as the white convicts' lust, the absence of white women in the bush, the native superstition that a young woman whose first intercourse was with a white man would bear afterwards exceptionally strong and healthy black sons, and the customs of exchanging wives, of handing over a wife, when going on a journey, to an unmarried male friend, and of providing visitors, both black and white, with female bedfellows.

NATIVE "DOCTORS."

Like other savages, the Australian aborigines in their natural state are firm believers in their native "doctors," who, as elsewhere among uncivilized people, are usually arrant frauds. Dances, incantations, and legerdemain are their chief stock in trade. A "doctor" will examine a patient, feel the parts affected, rub them, suck them, and then pretend to have discovered the cause of the sickness. Thereupon he goes away for a few minutes, returns, resumes his rubbing and sucking, and presently, after a little manœuvring, seems to produce from the affected part pieces of stone, bone, stick, charcoal, or even string, and triumphantly announces that these have been the cause of the trouble. This reminds one of the Chinese tooth-ache-curiers, who produce little bunches of worms(?) from decayed teeth. But the strangest thing about the business is that a "doctor," though knowing full well the fraudulent nature of the whole procedure, will, when ill, call in another "doctor" to practise upon him! Fancy one "medical clairvoyant" calling in another to diagnose his sickness! Yet it is certain that cures often follow all this nonsense. Probably "faith" and nature are the true healers in such cases.

ABORIGINAL THERAPEUTICS.

Some tribes, however, proceed in a much more rational manner, employing the lancet, bandages, splints, poultices, plasters, water-compresses, lavage, massage, bleeding, vapor baths, emetics, astringents, etc. Here are a few examples of their methods of treatment:

Boils.—When hard, boils are treated with a decoction of wattle-bark (*Acacia pyrenantha*); when, after this treatment, they are obstinate, a poultice of boiled marshmallow (*Althæa officinalis*) is used; if they soften without breaking, they are pricked with a bone lancet. When the boil comes on a limb, a ligature is tied above to check circulation.

Colds.—Sometimes the treatment for these is cold water within and warmth without; sometimes an infusion of wild mint (*Mentha laniflora*) is given internally, and, as an aperient, an infusion of wild lavender-tree leaves.

Colic.—Sometimes friends press and knead the stomach with their feet; sometimes hot eucalyptus leaves or hot stones are applied.

Dysentery.—A decoction of wattle-bark is sometimes taken inwardly for dysentery, while wattle-gum is chewed all day, and pills of wattle-bark and gum are taken night and morning. Sometimes the patient lies on his back with his head turned sideways, and a native doctor presses the up-turned ear with his foot till the pain causes water to gush out at the eyes, and occasionally this effects a cure.

Dyspepsia.—Cold water is given inwardly and outwardly.

Ear-Diseases.—These are treated with juice from the roasted fruit of the red eugenia (*E. australis*).

Fever.—Sometimes fever is treated with an infusion of the leaves of *Eucalyptus tetradonta*; at other times by means of continual bathing. The latter treatment is generally fatal.

Headache.—A tight bandage, often of green hide, is bound round the head; or the head is held over a fire of green twigs; or smoked green leaves are applied hot; or blood is let from the temples, scalp, or forearm.

Lung-Disease.—If the blood-spitting becomes serious, a native “doctor” presses with his feet or even jumps on the patient’s body; the natural result is hemorrhage and death.

Neuralgia.—A poultice of fruit of the red eugenia (*E. australis*) is applied to the affected part.

Ophthalmia.—Eye-troubles are treated with the juice of the pig-face (*Mesembrianthemum æquilaterale*), or by means of repeatedly washing with water.

Rheumatism.—The skin is scarified; or hot stones are applied to the part; or it is poulticed with boiled marshmallow (*Althæa officinalis*); or a tight bandage is bound over the affected part; or hot ashes are rubbed in; or the patient is buried neck-deep in the sand of the sea-shore; or the patient is laid on a wicker stage, under which heated stones covered with wet water-weed (“pinngi”) are placed, and the whole is covered in with rugs; in fact, an improvised vapor-bath is given.

Skin-Diseases.—Affections of the skin are treated by bathing and attention to cleanliness; or by an ointment of grease, red ochre, and a decoction of wattle-bark; or by scratching the parts with shells; or by bruising the pustules; or by opening the pustules with a pointed stick or piece of bone.

Small-pox.—The juice of a leafless creeper, name unknown, is used as a therapeutic agent. Whether it is really efficacious is not known.

Sores.—Sores are sucked by a native “doctor”; or regularly washed with water; or a ligature is tied above; or hot earth or ashes are bound on.

Venereal Diseases.—A very strong decoction of wattle-bark is used in all venereal diseases, and has been found very efficacious even in severe attacks of syphilis.

Toothache.—The gums are bled.

Snake-bite.—The wound is sucked; or a ligature is applied above and below, and an artery is opened, or else numerous incisions are made between ligatures, and the sufferer freely bled.

Fracture.—Fractures are bound up in bark splints, and recovery takes place in a short time; if it is a comminuted fracture of limb-bones, and it is impossible to save the damaged part, it is inserted in a hole in the ground, which is filled with earth to a point a little above the injury; live embers are then placed round, and the injured part thus burned off.

Burns.—Burns are first greased with melted fat and then dusted with red ochre.

Wounds.—Eucalyptus gum or bark steeped in urine is employed as a dressing, or the wound is cauterized; or it is sucked and then either poulticed with chewed or steeped eucalyptus leaves, or plastered with clay, earth, mud, or hot ashes.

Spear-wound.—When the spear remains in, the shaft is broken off short and the barbed part is pulled through; or the spear is twirled round till the wound is large enough for it to be drawn out easily.

Sting.—Hot leaves are applied.

Bleeding.—Hemorrhage is stopped by binding with spongy bark; if the bleeding is from a limb, a ligature is applied above.

The aborigines in their natural state recover very rapidly from wounds and fractures, even when they are of the most serious kind. A fractured collar-bone has been restored to working order in three days, and no inconvenience suffered then or afterwards. Their power to endure pain, labor, and hunger is astounding.

OPERATIVE SURGERY.

Beyond the use of ligatures, bandages, splints, the lancet and the cautery, the blacks know practically nothing of surgery. Their nearest approaches to operative surgery proper are connected with ornamentation of the body, coming-of-age rituals, Malthusian purposes, and incantation ceremonies.

For ornamental purposes, they make a series of parallel scars on the chest, back, upper arm, and the thighs in the case of both sexes, and on the abdomen and round the breasts of females. In most tribes, also, the septum of the nose is pierced with a pointed bone or stick, and the hole is kept open with a quill, to allow of the later insertion of some foreign body, such as a feather, bone, or twig. The parallel wounds are cut with sharp flints, quartz slivers, or shells, or are burned in with sharp hot stones. They are then filled in with earth, charcoal or ashes, and the edges are kept from uniting for some weeks. When healed, the scars are about the length of the little finger, and nearly half an inch high. They resemble nothing so much as rows of large, well-gorged leeches.

Coming of age is marked by knocking out, in various ways, either one or two incisor teeth. The gum round the tooth is first loosened, and then the tooth is made free by placing a stick against it, chisel-fashion, and using a light club as a mallet. Sometimes wedges are fitted in on each side, and then the tooth is loosened as before or the wedges themselves are alternately hammered till the desired end is accomplished. Sometimes the tooth is

made loose with a forked stick used as a lever. The tooth, when loose, is removed by the operator's fingers, and the bleeding is stopped with damp clay or a fire-stick cautery, or else it is allowed to continue.

Circumcision has two ends in view. It is done with a jagged flint at coming of age to test the lad's power of enduring pain, but it also serves another purpose, in that for some time it prevents the young men from intriguing with the young wives of the old men.

Malthusian operations are two. In some few tribes the nipples are cut off the breasts of the girls to prevent them suckling children. In very many tribes what is known as "the terrible rite" is practised on most of the young men, being omitted only at times when the tribe, from sickness or warfare, has been much reduced in numbers. The patient is taken into the bush and spread-eagled on his back; one man holds each limb down firmly, and a fifth sits on the patient's chest. The operator then lays the penis flat on a piece of bark, slits up the urethra from meatus to base, and then binds the organ up with bark in such a way as to effectually prevent closing. The patient is thus practically, if painfully, rendered sterile.

Incantations are often accomplished with woundings. For example, in the spell to make wild fowl lay plenty of eggs, the men of the Dieri tribe sit in a ring singing an obscene song, and at the same time piercing the scrotum over and over again with the sharpened fibula of a kangaroo. Though this often lays them up for a fortnight or so, they exhibit no signs of pain while the ceremony is going on. During a similar spell to make iguanas plentiful, they pierce their ears several times with leg bones of the emu.

The *amputation* of one or more of the joints of a girl's little finger is done in early childhood by the mother tying a ligature of twine or strong spider's web round the finger, and leaving it there till the joint or joints drop off. The reason for doing this is that the blacks have an idea that the normal little finger is in the way when a woman is rolling up fishing-lines.

In cases where surgical operations involve great pain, it is sometimes relieved by iguana fat.

OBSTETRICS.

As a rule, the aboriginal woman suffers little pain or inconvenience from parturition. During delivery the woman kneels with thighs wide apart, and sitting on her heels, her feet being laid flat on the ground, soles uppermost. One woman squats behind the parturient, and with arms round her waist forms a support for her back. A second midwife does what necessity requires. I have read of women being delivered while standing against a tree. This, however, must refer to cases of sudden labor in which a woman, being alone, squatted (they never *stand*) with her back against a tree, which replaces the support usually given by the midwife.

Though occasionally denied, it is well known to bushmen that twins and triplets are as common among Australian aborigines as among Europeans. It is remarkable that the children are at birth nearly as white as Europeans,

so that the natives sometimes doubt whether they are of pure blood or not. In such cases the form of the nose decides. Half-caste children have occasionally light-colored hair and European features; in fact, it is commonly noticed that the half-caste boy favors the father much more than the mother.

Abortion is occasionally practised, being brought about by pressing or thumping the abdomen. Also, the excessive use of alcoholic drinks lowers fecundity and tends to miscarriages, and prostitution causes sterility, while an excessive use of tobacco causes the infants to be abnormally fat and bloated at birth; such children invariably die.

Count Strzelecki and others have stated that an Australian woman, after having a child to a white man, is ever after sterile to a man of her own race. Not only is such a theory absurd on the face of it, but it is contrary to the experience of bushmen throughout the continent. Brough, Smyth, and Curr have set the question at rest by proving numerous specific cases, not only of black children following a half-caste, but of black, followed by half-caste, followed by black; also at least one case is known of black, half-caste, black, half-caste, black. That case alone shatters Strzelecki's theory at a blow.

A SPECIAL DISEASE.

One disease seems peculiar to the Australian blacks. The stomach becomes perfectly hard, and gradually enlarges enormously. The body wastes to a skeleton, while the appetite is voracious, with an especial craving for meat, though the patient can eat but little at a time, and the food does not seem to nourish. Great debility ensues, and, after many months of misery, the relief of death. Many medicaments have been tried but without success. As no *post-mortem* has ever been held on such a case, even the knowledge derived from anatomizing a case is wanting.

SYPHILITIC SPINAL PARALYSIS.¹

BY J. SOTTAS, M.D.,

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THE chief interest in regard to syphilis in the affections of the nervous system lies in the forms it can assume,—in the present case in the cord,—

¹ Dr. Sottas has presented to the public an exhaustive work on syphilis of the spinal cord in the light of knowledge of the present day. There has been no attempt made to do full justice to a book of four hundred and fifty pages in a translation so abridged, but the endeavor has been to offer the chief ideas of the author. The entire second part, devoted to the histological and clinical examination of personal cases, and to the study of those borrowed from other writers, has been left untouched. The three cuts were kindly loaned by the *Revue Neurologique*. W. G. SPILLER.

and in the influence it is capable of exerting in the development of spinal diseases. The first problem only is herein treated, and such systemic troubles as tabes are left untouched.

If the reality of syphilitic myelopathies is acknowledged, it is from a conviction largely due to clinical observation, and on a clinical foundation the syphilitic nature of an affection of the nervous system can be affirmed only by the reasoning *post hoc, ergo propter hoc*. It is true that in certain circumstances this induction has a peculiar value. If, for example, lumbar pains, trouble in micturition, later a more or less rapid weakness of the legs, yielding soon to symptoms of spastic paraplegia, appear in a young person, syphilitic for some months or a few years, it is natural to think of the influence of syphilis, and if no other cause of lesion of the cord, as Pott's disease or traumatism, is evident, this supposition is almost a certainty. But there are other cases where the diagnosis rests on far less precise facts. If the paraplegia occurs in an individual advanced in life, syphilitic for a long time, can one affirm the syphilitic nature of the affection, or is it a paraplegia of unknown origin which has occurred in a syphilitic person? The difficulty very often cannot be settled during the life of the patient. Even at the autopsy it is not always easy to establish precisely the specific nature from the anatomical condition.

The uncertainty increases in regard to certain systematized forms of myelitis, as tabes, which many writers consider to be due either solely or frequently to syphilis.

Are there, in correspondence with the different clinical manifestations of syphilis, special anatomical alterations which permit a classification of these forms? We will first endeavor to ascertain if there are specific lesions of syphilis, and what tissues in the cord can be involved.

As we are ignorant of the nature of the syphilitic infectious agent, we have as a guide only the study of the histological reaction of the tissues involved. In reasoning by analogy we compare the action of the syphilitic virus with that of other infectious agents which produce lesions with a tendency to the formation of nodules, as in glanders, tuberculosis, etc. The specificity of the tubercle has been established only by the isolation, the culture, and the inoculation of the bacillus of Koch. Is the tubercle the sole mode of reaction of the tissues to this bacillus? Cannot this agent produce modifications of the connective tissues other than the tubercle? can it not affect the more essential elements of the different parenchymata? The same questions arise in regard to syphilis, when they are more obscure still, for the reason given.

According to the general opinion the syphilitic virus exerts its influence chiefly on the tissues derived from the mesoderm, especially on the bony and connective tissues and the lymphatic and vascular systems. It is possible that the differentiated elements which constitute the noble tissue of the different organs may be equally directly affected, but this action has

never been actually demonstrated; and until proof to the contrary, the parenchymatous lesion may be considered secondary.

The mode of reaction of the affected tissue has a close affinity to ordinary inflammation, whatever may have been the date of the infection, and here the distinction of secondary and tertiary periods has no foundation. The process of irritation is always the same: it consists in a hyperplasia of connective-tissue cells, of the presence of lymphoid cells, and of a multiplication of those elements which take part in every inflammation.

This inflammatory hyperplasia is often presented in a special form. It can give rise to the formation of specific granulomata, of which the structure has permitted the establishing of the relation between syphilis and the other infectious maladies with nodulary formation.

The importance of this neoplasia is variable, and there are all the intermediate stages between the infiltration more or less conglomerate, which may be regarded as the microscopic (miliary gumma) and the macroscopic gumma. But this cellular hyperplasia is not necessarily circumscribed, this specific character can fail, and there is then a diffuse infiltration.

The evolution of the gumma may be divided into two periods: the first is characterized by the hyperplasia of the cells of the connective tissue, or of similar tissue; in the second, the elements multiply, crowd upon one another, and diminish in volume, while the cells of the central part become granular, atrophy, and the centre of the tumor undergoes caseous change. This tendency to retrograde transformations (fatty and cheesy degeneration) is perhaps peculiar only to large gummata. It is not illogical to consider it as resulting only from the condition of the tumor itself, of which the elements produce by their crowding together an obstacle to the nutrition of the central part.

Have the diffuse gummatous infiltrations the same tendency to this necrobiotic change, or does this tissue, well nourished, remain always vigorous, and tend to become sclerotic? We will find examples of these two forms of evolution outside of the gumma properly so called.

Can syphilis provoke the sclerosis from the beginning? In other words, is it possible to recognize a syphilitic origin for sclerotic lesions not accompanied by diffuse or conglomerate gummatous infiltrations? This is a question still disputed, and especially by the partisans and adversaries of the syphilitic nature of certain systematic affections of the cord.

We have indicated rapidly the modes of reaction of the connective tissue in the presence of the syphilitic infectious agent, but this element is not the only one affected: the predilection of the virus for the vascular tissues is well known, and the vascular alterations are now counted among the manifestations, so to speak, constant in the anatomical modifications produced by syphilis.

Here, as elsewhere, the process lacks anatomical characteristics; it is an infiltration of ordinary aspect, of which the point of departure is still disputed. Certain authors (Heubner, Gerhardt, Litten) regard the internal

tunic as the point of departure of the inflammation. Others (Köster, Lancereaux, Friedländer, Baumgarten) think that the process begins in the adventitia, the other coats being only secondarily affected. Rumpf believes that the thickening of the arterial walls is due to the inflammation of the vasa vasorum, and that the infiltration arises in the media, where the capillaries are the most numerous.

In the nervous centres, and especially in the cord, the syphilis affects primarily only the connective, lymphatic, and vascular tissues.

Whatever may be the tissue involved the inflammation is of the same nature, and there is no real difference between the gumma and the infiltration of the meninges or vascular walls.

It is important to determine the frequency of these localizations, and their relative importance in the determination of the lesions of the nervous parenchyma. We believe that the vascular lesions have a preponderance in importance in the cord, and it is this we attempt to prove in the present work.

Most writers describe two forms of the diffuse syphilitic affection of the cord in relation to the intensity of the symptoms and the rapidity of their evolution: the acute and chronic syphilitic myelitis. The chronic form is the better known, and is often called syphilitic spastic paraplegia, because of the preponderance of spastic symptoms in the inferior members. The acute form, much less known, has been described as assuming the form of an acute diffuse central myelitis. It has always been completely separated from the chronic form, clinically and anatomically, but it is doubtful if there is such a difference between the two, and it is more probable that they arise from an identical process, and that the different clinical appearances are due to variation in extent and intensity of the same lesion. The probability of this is increased by numerous intermediate forms. It is not uncommon to observe the syphilitic paraplegia begin abruptly, and afterwards yield to a persistent spastic paraplegia of a chronic nature. Or in the course of slow evolution, acute attacks occur which aggravate the situation, and rapid death may be caused by such an attack. In still other cases after a period of fluctuation the symptoms increase progressively to a fatal termination. Although these forms may indicate a purely spinal location, the symptoms of cerebral syphilis are often added.

The authors have divided the syphilis of the cord in three groups:

The first comprises the osseous affections, which have their point of origin in the vertebræ and involve the cord secondarily.

In the second are placed the lesions of the meninges, represented by the gumma, the diffuse infiltration, or the fibrous thickening of these envelopes, especially of the pia mater.

In the third category are found the lesions of the cord proper,—myelitis,—but here the confusion is great, and one finds sometimes softening of the cord, sometimes sclerotic induration or embryonic infiltration, and this confusion is not lessened by the employment of so vague a term as mye-

litis. It would be possible to place in a fourth class the cases where the vascular lesions preponderate. These lesions were formerly overlooked, but the analogy with similar lesions in cerebral syphilis has been recently more emphasized. In all the types, gumma, meningitis, myelitis, the vascular alterations are considerable.

The division between the lesions of the pia and those of the cord itself, made for convenience, has no real foundation, for alterations of the nourishing membrane of the cord, however little pronounced, cannot exist without provoking trouble of nutrition and alteration in the cord itself. The lesions of the nervous parenchyma are always subordinate to the primary modifications of the nourishing system of the cord, meninges and vessels.

SYPHILITIC LESIONS OF THE VERTEBRÆ.

Formerly the majority of cases of syphilitic paraplegia observed in syphilitic persons were regarded as due to lesions in the vertebral column, and following the description of the authors two forms were presented: an osseous caries developed under the influence of the syphilis, which by the intermediation of the pachymeningitis produced the paraplegia; and an osteo-periostitis, followed by the development of an exostosis, which compressed the cord.

The syphilitic form of Pott's disease was first described by Portal in 1797. The important rôle ascribed to the exostosis is evident in reading the accounts of the paraplegia ascribed to syphilis, and about the middle of the present century amelioration of a paraplegia by specific treatment was sufficient for the diagnosis of an exostosis reabsorbed by such treatment, also isolated cases of vertebral lesions were found at the post-mortem table. However, doubt began to be manifest among pathologists, and the opinion is now current that, although syphilitic lesions of the spinal column exist,—for there is no reason why the vertebræ should not be involved as well as any bony part of the body,—still such lesions are rare and are not always easy to determine, especially caries, as being of syphilitic nature. You will notice, in the *résumé* of the cases published as yet, that the anatomical verification fails in a certain number. Often a deformation of the vertebral column existed, and had some value for the diagnosis; but where this sign was wanting, one was obliged to depend on the influence of the treatment, which, however, is not always reliable. There is in reality a very limited number of cases in which, together with the spinal paraplegia, alterations of the vertebræ, probably syphilitic, have been found.

MENINGO-MEDULLARY SYPHILIS.

The massive gummata of the meninges and cord with considerable thickening of the meninges are rare occurrences. This does not mean that gummatous formations are to be considered exceptional; on the contrary, they are frequent, and are in a way one of the characteristics; but the circumscribed infiltration is usually reduced to a microscopic nodule. Like-

wise the thickening of the meninges is frequent, but it is generally not very pronounced, and seldom produces the condition which has been described by the name of syphilitic pachymeningitis.

When the insufficiency of the theory of exostosis was recognized, the prominent alterations of the cord and its membranes attracted attention. Although a certain importance was granted to syphilis in acute and chronic diffuse myelitis, the gummatous tumors of the cord and the gummatous and fibrous thickening of the meninges were alone considered to be characteristic.

The gumma is a common manifestation of syphilis, and there is no reason why such lesions should not appear in the connective tissue of the envelopes of the cord. Such observations are rare for macroscopic gummata. Transitional forms exist also between the slight diffuse gummatous thickening of the meninges and the massive gummatous tumor. It is necessary to say that the macroscopic appearances by which the syphilitic nature of the tumors is diagnosed do not always offer absolute certainty. Even competent histologists are often puzzled.

It is only with considerable reserve, and after a careful microscopic examination of the different parts of the spinal axis at regions where the elementary lesions are found, that one can admit the syphilitic nature of such tumors.

Together with the infiltrations, circumscribed or more or less diffuse, considerable fibrous thickening of the meninges is described.

Such alteration of the meninges, and especially of the dura, may be secondary to the osseous lesions of the vertebral canal which produce an external pachymeningitis. But the point of origin can be in the meninges themselves, and especially in the softer vascular pia. More rarely the lesion occupies primarily the internal face of the dura. Later all the envelopes are involved, become united, and form a thickening, which surrounds the cord sometimes, as a sort of fibrous collar.

It is remarkable that the meninges of the superior part of the cord are those usually involved in these cases, and that the dura plays an important part. The development of the process seems to follow the law of Jürgens. This author believed that the syphilitic lesions of the cerebro-spinal axis follow a descending march, and are propagated from the brain to the cord. In these cases, in reality, the lesions of the cerebral meninges, especially at the base, are very marked, and they decrease as more inferior regions of the cord are examined. But this law is rigorously applicable only to special cases, which can be classified under the designation of syphilitic cerebro-spinal meningitis, as proposed by Lamy.¹ Considerable thickening of the membranes and the participation of the dura can, however, be found in the regions of the cord at some distance from the brain.

The lesions of the nervous parenchyma are important, for it is to them

¹ Lamy, Thèse de Paris, 1893, p. 56.

that sooner or later are due the symptoms and often the death of the patient; but it is relatively only late that they acquire this importance in certain forms of meningitis, when the process has already attained an advanced degree. It is evident that in these cases the meningitic lesion can attain considerable intensity without at first producing grave lesions of the cord. This is a remarkable circumstance, which does not occur in the ordinary cases of medullary syphilis, as we shall see. It would seem to prove that it is not so much the considerable thickening of the meninges which has an influence on the condition of the medullary parenchyma as the alteration of certain important elements of the nourishing membrane,—of the vessels, especially. In the majority of cases of spinal syphilis, one has to do with more diffuse lesions than the gumma and the pachymeningitis, and it is by a histological study that one discovers the alterations of the cord and meninges. Numerous writers have spoken of the whitish and dull appearance of the pia and of the clouded condition of the arachnoid. Knorre has mentioned the existence of milky patches on the pia, which he regarded as capable of causing the thickenings and adherences of the membranes, or as being the point of origin of the gummatus developments. There does not exist in reality a clearly-defined distinction between the extended diffuse lesions, which are only appreciable by the microscope, and the macroscopic alterations represented by a considerable thickening of the meninges or the production of massive gummata. The different appearances are due to the duration of the affection. There are transitional cases where, by the side of macroscopic lesions, considerable microscopic changes are noted. Sometimes the cord appears normal to the naked eye; but it is possible by the exterior aspect, the consistency, and the coloration of the different parts, to recognize any important alteration in this delicate tissue.

The anatomical modifications of the syphilitic paraplegia with a rapid evolution can be properly appreciated only with the microscope. The cases of rapid progress are best fitted for the study of the initial lesions. In the prolonged cases it is possible to interpret them by the forms of transition, and to discover the connection of the different alterations.

In the gumma and the circumscribed thickening of the meninges, the cord is only secondarily involved, and relatively late. It is more common to find the meninges and cord equally involved in the syphilitic process, and marching hand in hand. To this condition has been given the name of syphilitic meningo-myelitis.

Julliard has attempted to show the predilection for the lymphatic system. This conception arose from the diffusion of the inflammation in the meninges and the perivascular sheaths. Gilbert and Lyon¹ have proposed the following classification:

1. The hyperæmic and necrobiotic meningo-myelitis, characterized by a congestion and perhaps a multiplication of the vessels of the cord and its

¹ A. Gilbert et G. Lyon, De la Syphilis médullaire précoce, Arch. de Méd., 1889.

coverings, which cause nutritive disturbance in the nervous axis, and finally the softening of the cord.

2. In the embryonic meningo-myelitis, cellular hyperplasia, diapedesis, and vascular exudations appear, and microscopically one finds a luxuriant proliferation of young cells in the vascular walls and in the substance of the pia and its intramedullary prolongations, likewise the production of a subpial fibrino-leucocytic deposit.

3. The disseminated round cells in the cord and meninges pursue their course, and end in the formation of an adult tissue, the meninges become thickened and united, the cord becomes hard, and the microscope shows the substitution of the meningo-medullary elements by a fibrous tissue, principally developed about the vessels, of which the walls undergo notable change in this diffuse sclerotic meningo-myelitis, as in the preceding forms.

4. Finally, the round cells accumulate at certain points in the form of small tumors, and undergo the degeneration proper to nodulary syphilitic formations, and thus is formed the gummatous meningitis, the gummatous myelitis, or the gummatous meningo-myelitis. According to this description, the alterations of the pia and cord are simply the result of an inflammation developed under the influence of the syphilitic poison, and the different forms correspond to variations in the evolution or duration of the same process.

We consider the alterations of the nervous parenchyma in the more common cases as primarily of a degenerative order, and as provoked by the troubles of nutrition resulting from lesions of the nourishing organs of the cord. This is not a new idea, but sufficient importance has not been paid to it.

Lamy¹ has recently stated that the primary lesions occupy the meninges and vessels, and that the nervous elements are involved secondarily, either by the direct propagation of the infiltration of the meninges to the cord, or by the circulatory disturbances which result from the vascular obliterations. These two forms of alteration usually coexist, with predominance of one or the other, and at times the changes of the meninges may be so slight that one would be almost justified in describing separately the phlebitis and arteritis of syphilitic origin.

We will go further. The specific infiltration can in certain cases be propagated from the pia to the neighboring nervous parenchyma, it can develop primarily in the cord about the vessels; but the infiltrations are usually very limited, except when they assume certain special forms (gummata, pachymeningitis). The important alteration is the necrobiotic change in the nervous tissue. Although secondary, this anæmic necrosis is, nevertheless, the principal lesion, and it is to this that is due usually the syphilitic paraplegia which we associate with a transverse myelitis.

In the forms with a rapid evolution, we may by the study of lesions of

¹ Lamy, loc. cit., p. 31.

recent origin establish the true nature of the process; but in the chronic forms the interpretation is more difficult. In the observations which we give, the variation in the form and diffusion of the lesions is a striking feature; however, the modifications in the meninges and vessels are constant, and Julliard has made of this localization the characteristic feature of syphilis. In the ignorance in which we are at present regarding the nature of the specific agent, we are not able to propose another criterion. While recognizing that the participation of the lymphatic and vascular passages, the diffusion of the lesions, and the impossibility of their systematization are the characters of the syphilitic inflammation, it is necessary to confess that there is nothing special in the process, and that the connective tissue and the lympho-vascular system are a common soil for the evolution of every infectious agent.

According to the general opinion the vascular lesions and those of the meninges are primary, the alteration of the nervous tissue is secondary; and there are two special forms of this alteration,—the softening of the nervous tissue with destruction of the noble elements, and the induration with sclerosis. The state of softening is much more frequent, in the cases of rapid progress it exists almost alone, and in those of chronic development terminated by an abrupt attack the softening is found together with more ancient lesions.

The softening of the cord in syphilitic myelopathy has been noted for a long time. It is sometimes accompanied by very evident macroscopic lesions of the meninges, but usually the meningitic lesions are observed only with the microscope.

The softening may be located at any point of the cord and may occupy an extent more or less considerable. It is sometimes localized at the periphery, sometimes in a central part, or it may involve a whole segment and assume a transverse type.

The intensity of the softening varies in degree. There may be complete destruction of the nervous tissue and the formation of a creamy substance. The process consists in a destruction more or less advanced of the noble elements with the formation of the products of necrosis, amorphous, granular, albuminous substance, granules of myelin, granular bodies, etc., and in a special alteration of the interstitial tissue peculiar to the nervous parenchyma. There is an exaggerated development of Deiter's cells. These modifications are not special to syphilis. In these cases there does not exist a trace of inflammation of the interstitial tissue, which proves that the destruction of the noble elements is not consecutive to an inflammation of the interstitial tissues, and that it is necessary to seek another explanation for this phenomenon.

In cases of syphilitic paraplegia without material lesions, their absence is probably due to the brief duration of the trouble and to the slight involvement of the meninges.

Recent works have called attention to transitory nervous symptoms

which occur in the secondary period,—headache, faintness, modifications of the pulse, etc.,—and which indicate the involvement of the entire nervous system. Perhaps in certain cases they may be exaggerated and cause particular forms of the paraplegia, but these manifestations ought to be separated from the common syphilitic myelopathy.

Writers speak also of the induration of the cord from sclerosis, and they agree in recognizing that if the softening characterizes the rapid forms, the sclerosis pertains to the chronic forms. The sclerosis is only then the last stage of the process,—of the inflammation of the interstitial tissue of the cord.

We would call attention to the fact that the tissue of the sclerosis is not always of the same nature. Sometimes—and this is not so common—it is a cicatricial tissue resulting from the organization of a specific infiltration. The gummatous infiltration arising from the pia or the vessels is characterized at first by an embryonic proliferation which can invade more or less the medullary parenchyma, and produce later a sclerotic tissue. The sclerosis gives a special appearance, the neuroglia does not enter into its constitution.

Usually the sclerosis is purely of the neuroglia; it is preceded by an inflammatory reaction of its own tissue, but this irritation is consecutive to the destruction of the noble elements. In cases of rapid evolution it is possible to constitute the destruction of the nervous elements at a time when the neuroglia does not present a trace of reaction. It is this neuroglia sclerosis which forms the zones of degeneration in the cord. Sometimes it is diffuse and seems then to be the result of a previous state of softening; sometimes it assumes a systematic disposition, and produces the secondary degeneration of the columns of white matter. Usually the spinal roots are not much involved in syphilis; however, they are at times sufficiently so to play an important part in the symptoms, and this is especially true in the very marked lesions of the meninges. Although many writers had spoken of the part played by the arteries in cerebral syphilis, it was due to Heubner¹ that a great advance was made in this direction. According to his view these lesions of the arteries may exist sometimes alone and at other times with syphilomata. The alteration is believed to arise in the internal coat between the fenestrated membrane and the endothelium, and consists in an accumulation of round cells. It would thus have an origin purely endarteritic and be produced by the irritation of the syphilitic blood; later it extends to the adventitia. While the proliferation of the intima is due to proliferation of the cells of the endothelium, the round cells which infiltrate the external coat come from the capillaries of this tunic, and again it is the direct action of the blood according to Heubner. This hypothesis has been contested. Credit has always to be given to Heubner for showing the frequency of arterial lesions in cerebral syphilis.

¹ Heubner, Die luetische Erkr. der Hirnarterien, etc., Leipzig, 1874.
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Baumgarten believes that the origin is in the vasa vasorum and the perivascular space of the adventitia, and that the proliferation of the internal membrane is secondary (Virchow's Archiv, vol. lxxxvi. p. 219). The modification of the circulation and of the nutrition which results from this change in the external coat provokes in the intima a lesion which can be propagated to portions of the vessel where the adventitia is sound. According to this conception the blood in the lumen of the vessels has not a great influence on the nutrition of the vessel: the nutritive current in the capillaries, and therefore the order of involvement, is from without inward. Lancereaux¹ acknowledged the same external origin, and explained it by the predilection of the syphilitic virus for the lymphatic tissues and the existence of the lymphatic sheath of His. Köster² believes that the primary lesion is a mesarteritis; that the origin is in the vasa vasorum, but the inflammation is first manifested in the muscular coat; and that the other lesions are due to a progressive invasion. Wherever the origin may be, the result on the circulation is the same.

As a point of distinction from the atheroma there is no calcareous and fatty degeneration; there are some exceptional cases which do not obey this law. These lesions which we have just described are applicable to the vessels of the whole nervous axis, to the cord as well as to the brain.

Greiff³ seems to have been the first author who insisted on the alteration of the veins, and since his publication the change in the veins has been acknowledged as constant, even preponderant. The infiltration from the beginning involves the entire venous wall, and this thickening leads to contraction or complete obliteration of the lumen. The same writer remarked that the infiltration of the pia is always much more marked in the region of the vessels, and it appears that it extends from this vascular origin, and that the meningitis and the affection of the vessels have a close union in origin. At other points there is not this relation of the lesion of the meninges to that of the vessels, and the two processes have a certain independence.

Cases exist in which the vascular alterations are almost completely isolated, as in the case of Schmauss.⁴ Here the inflammation was limited to the vessels, and even the smaller ones were involved, while the pia was sound. The arteritis of syphilis is a panarteritis, it involves all the coats of the vessels, and the hyaline change may lead to complete closure of the vessel. Möller⁵ likewise has recorded a case where the lesion was confined to the vessels. In these two cases the paraplegia occurred abruptly, and death was speedy. There is a close resemblance in this to the cerebral

¹ Lancereaux, *Traité d'Anat. pathol.*, 1878-1881, vol. ii.

² Köster, *Sitzungsb. d. niederrhein. Gesellschaft für Natur. u. Heilk.* in Bonn, 1874, and *Berlin. klin. Wochenschrift*, 1876, p. 454.

³ Greiff, *Arch. f. Psych.*, 1882, Bd. xii.

⁴ Schmauss, *Deutsches Archiv f. klin. Med.*, vol. xlv. p. 244.

⁵ Möller, *Arch. f. Derm. u. Syph.*, 1891, vol. xiii.

softening of syphilis by arteritis. Even in forms less pure the vascular lesions play an important rôle. In seven cases which we publish in this work, the vascular lesions were predominant, and we ascribe to them the principal alterations of the nervous tissue and the chief symptoms of the clinical picture. In short, in every form of syphilitic myelopathy the vascular alterations have been noted, and they are very early in point of origin. The modifications of the nourishing membrane of the cord are the first in date, and from these arise the changes of the cord proper. We attribute the softening to the circulatory disturbance due to the vascular lesions.

The physiologists have attempted by ligature of the aorta or by injection into the femoral artery of inert powder to produce an arrest of the spinal circulation. As a result of the various experiments we have two facts of importance: the production of a paraplegia and the softening of the cord; other symptoms are anæsthesia of the parts involved, paralysis of the sphincters, and grave trophic troubles. It has also been shown by the experiments that the circulatory alterations in the cord are capable of producing very marked subjective sensations. The result of the cord anæmia is the necrosis of the nervous elements. The gray substance is first affected. The cells undergo the process of degeneration, the fibrilla of the gray matter becomes varicose, the white matter is soon affected, the axis cylinder swells, the myelin becomes granular, the capillaries dilate, small hemorrhages take place, the cellular elements are increased in number, and many granular bodies appear. Later, the interstitial tissue reacts and produces the sclerosis. It is thus easy to study the evolution of the cord softening in the animal, and there are a few cases of paralysis of the lower limbs following obliteration of the aorta; however, in these there were symptoms due to peripheral arrest of the circulation. Just as all the lesions of the brain were regarded as inflammatory before the idea of softening was accepted, so it is certain that a large number of the inflammatory conditions of the cord which have been described were only ischæmic softening.

Vulpian¹ ascribed to the ischæmia of the cord certain clinical symptoms, and compared them to the attacks of cerebral origin. Such spinal paralysis is much more rare than the cerebral, due to the condition of the circulation in the cord. The anastomosis here is extensive, and the anæmia exists only in very extended vascular lesions. The circulation of the cord is not as well known as that of the brain.

In the medullary softening of compression myelitis, the necrobiosis is explained by the external pressure, and the term myelitis is not justified, for it is a degenerative process.

It is very probable that other infectious maladies may affect the vessels of the cord, and certain paralyses in the course or at the termination of infectious diseases, as typhoid, small-pox, etc., and which present the picture

¹ Vulpian, *Maladies de la Moelle*, 1879.

described by Landry, may be due to vascular origin. In spite of the vascular lesions of medullary syphilis it is only recently that an important rôle has been attributed to them in the lesions of the nervous tissue, and it is Lancereaux who has especially insisted on this process and only from the clinical phenomena. These consist in premonitory signs preceding the paraplegia, which is of abrupt development, and characterized by a loss of reflexes, participation of the sphincters, and trophic troubles; later, if the patient does not succumb, the sensibility returns gradually and the contraction and the other spastic phenomena appear in the inferior members. The abruptness in the appearance of the paralysis is a characteristic phenomenon of the medullary softening of ischæmic origin; it is seen in those cases where the vascular lesions were almost exclusive and in all grave cases of syphilitic paraplegia, but it occurs also in forms of moderate intensity.

The chief objection to the vascular theory is in regard to the distinction which is made between the cord and brain circulations, and to the anastomoses of the cord. These anastomoses only exist for vessels of a certain order; they can also explain a certain number of phenomena, as the collateral congestion and the capillary hemorrhages which accompany the medullary softening. The small vessels are, however, end arteries, and their injury naturally affects the corresponding parts of the medullary parenchyma. The cord receives its blood-supply especially by the arteries of the anterior and posterior roots, branches of the spinal vessels from the vertebral, intercostal, lumbar, and sacral arteries. These branches perforate the dura, and divide into an ascending and descending branch, which anastomose with the corresponding arteries, and thus are formed arterial chains of which the principal are: an anterior supply situated in the anterior fissure, and formed from the arteries of the anterior roots (*tractus arteriosus anterior*); then there are two symmetrical posterior chains (*tractus arteriosi postero-laterales*) situated between the posterior roots and the corresponding lateral columns. From these systems a net-work in the pia is formed, and from this net-work the arterioles and capillaries penetrate into the substance of the cord. Once detached from the pia these small vessels do not anastomose.

The gray substance and the white substance constitute two separate vascular departments.

The gray substance is irrigated by the central arteries, which arise from the anterior chain, and, according to some writers, there is an anastomosis near the central canal. At different points of the cord these branches penetrate into the gray commissure at the base of the anterior fissure, and, having attained one or the other side of the central canal, divide into ascending and descending branches, which anastomose with similar ones. The artery at each part of the cord goes only to one side of the central canal,—sometimes to the one, sometimes to the other side.

The white substance is furnished by arterioles from the whole periphery. The anterior columns and the anterior part of the lateral columns are trib-

utaries of the anterior arterial chain, while the posterior column and the posterior part of the lateral columns, comprising the pyramidal tract, are under the control of the postero-lateral arteries. According to Kadyi, there is a zone of white substance surrounding the gray, which is supplied by both systems. We have observed that the nervous tissue of this zone was always more respected, even when the peripheral and central parts of the cord were very much altered.

It is necessary to examine the condition of these peripheral end arteries; often they are much more altered than are the vessels from which they arise. The vascular systems may be involved separately, or at least the lesions can predominate in one, and thus give rise to the appearance of systematization, which the medullary syphilis often assumes; in this way can be explained the poliomyelitis anterior of rapid evolution in a syphilitic subject. We would expect the vascular changes to predominate in the anterior system in such a case.

The veins of the cord anastomose freely everywhere. The largest of these are situated at the posterior and anterior median fissures. In the syphilis of the cord the veins are usually more affected than the arteries, and these lesions, in spite of the anastomosis, have an important bearing.

The mode of *début* of the paralytic phenomena is different according to the case, and there are intermediate forms between the apoplectic and the slow paraplegia. The abruptness is considered as an indication of softening of anæmic origin. The vascular alterations can attain a certain degree of development, and only produce slight circulatory trouble; but at a given moment, from one cause or another, the equilibrium is disturbed, and the consequences of the vascular trouble are rapidly manifested. In examining the cases followed by anatomical verification which have begun abruptly, it is seen that this phenomenon has existed when the lesions were almost or entirely vascular. This rapidity is almost characteristic of the grave forms, for it indicates that many vessels are involved and in rapid succession, and yet the same thing occurs in mild forms.

The *début* can be apoplectiform, usually it is less sudden; it is after some days that the paraplegia attains its maximum. This abrupt beginning has been noted in about half the cases, and we believe with Dejerine that it is more common than is usually supposed.

The predominance of the symptoms in one side of the body, the fluctuations in the evolution, the relapses, the attacks of paraplegia more or less grave, finally the "fragmentation" of the symptoms, are all explained by the vascular lesions. The circulatory disturbance can affect the respiratory and cardiac centres, and cause sudden death. At other times death is from decubitus and trophic troubles.

We have slighted the alterations of the meninges, because these lesions are of secondary interest, and usually act on the nervous tissue by the vascular changes accompanying them. The process at first is localized here about the vessels.

In some cases the infiltration may involve the cord considerably, the inflammation of the meninges can cause thickening and adherence of its envelopes, or a gummatous neoplasm is developed. Such lesions joined to the vascular disturbance give a special seal to the syphilitic process, but they rarely acquire any importance in secondary lesions of the medullary tissue.

The compression from a pachymeningitis or gumma can also have an influence on the cord.

We have examined microscopically seven cords. In the first case a man of thirty-four years, syphilitic since two years, was afflicted with lumbar pains, heaviness in the legs, and trouble in the sphincters. Some weeks later he was seized by an abrupt attack of paraplegia, and died sixty hours afterward.

This is an important case in regard to recognition of the nature of the lesions at the beginning of the affection. The vascular lesions were very pronounced, the veins were especially involved, and this condition existed at all points, especially at the level of the bulb. There were some perivascular infiltration and small gummatous nodules in the meninges and cord.

The vascular alterations had their maximum of intensity in the superior dorsal region, and here the cord was softened for a long extent. There was not a trace of inflammation of the interstitial tissue. It was, in short, an ischæmic softening.

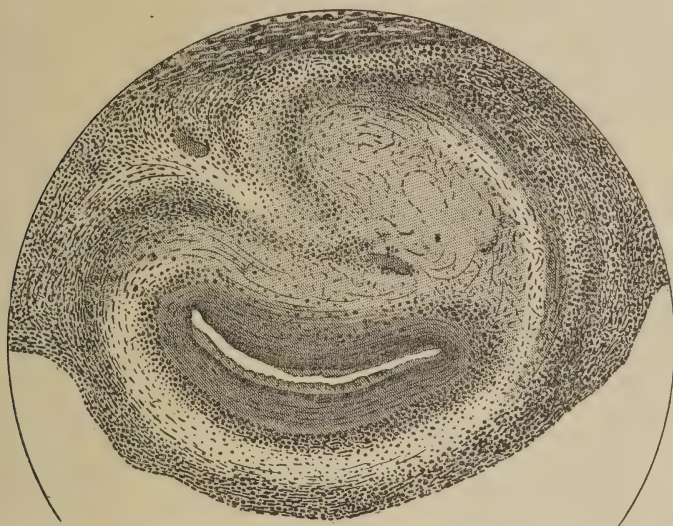
In the second case, a woman of thirty-four years had had syphilis since the age of twenty-six. Seven years after infection she presented the phenomena of diffuse cerebro-spinal trouble, which lasted some months, and was interrupted by an abrupt attack of paraplegia. After this the paralytic symptoms were accentuated progressively and rapidly, and the patient succumbed about five months after the attack of paraplegia. At the autopsy considerable vascular lesions and a marked infiltration of the meninges were found, with predominance of the inflammation about the vessels. At some points the gummatous infiltration developed in the walls of the veins formed quite large nodules, of which the centres were in process of cheesy change. The degeneration of the nervous tissue was more marked than in the first case. At certain points the invasion of the nervous substance by the specific infiltration from the pia or an intramedullary vessel was noticed; but these lesions were much less extensive than the alterations of a degenerative nature. The alterations of the roots, which are very marked in this case, seem, on the contrary, to arise from a progressive invasion of the infiltration.

The third case presented anatomical lesions similar to the second, but as the duration had been longer there were noted the signs of repair, neoformation of capillaries in the walls of the vessels and in the thrombus, and reaction of the neuroglia.

The fourth case showed sclerosis of the neuroglia.

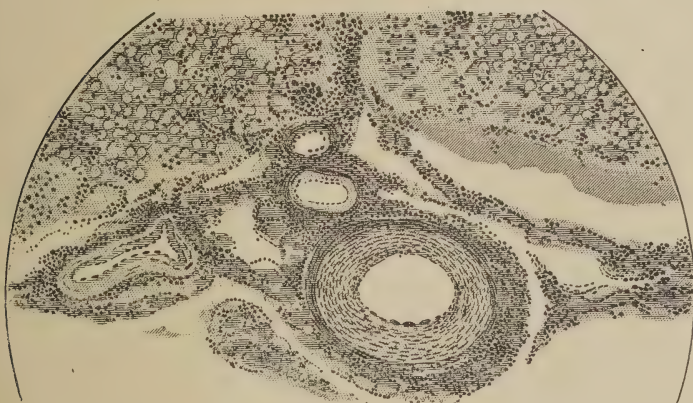
In all these cases the vascular alteration was constant, and the changes in the meninges were secondary.

FIG. 1.



Gummatous tumor developed in the wall of a large vein of the pia at the level of the bulb. The central part of the tumor is in a condition of caseous degeneration; the deep layers of the venous wall are affected by the same process. The lumen of the vessel is much flattened out, emptied of blood, and contains only some granular detritus spread along the internal surface. The peripheric layers of the neoplasm are formed by living cells, which invade the pia (in the right portion of the figure).

FIG. 2.



Arteries and veins in the neighborhood of the bulb. The arteries free in the subarachnoid cavity present the lesions of periendarteritis. A free vein is completely obliterated. The pia is relatively almost normal; it contains an inflamed artery, and a very dilated vein filled with blood.

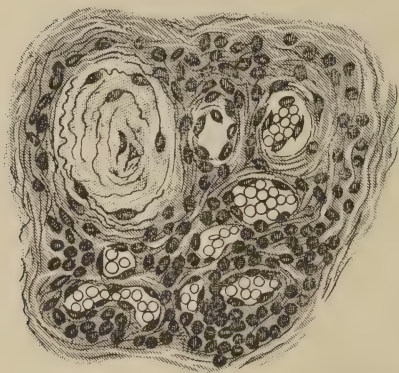
This fourth case shows that the alterations of the medullary tissue are due to the circulatory trouble, and not to invasion by a perivascular sclerosis, for in this case numerous altered vessels are found traversing sound

tissue, and the walls of the vessels which traverse sclerotic tissue have no adherence with it.

In the majority of the cases which permit the survival of the patient, the alteration of the medullary substance is situated in the dorsal region, the lumbar centres are preserved, but their function is modified by the presence of the lesions situated above and by the sclerosis of the pyramidal tracts. The patients present a spastic paraplegia. This is the type described by Erb.

The clinical picture depends on the location of the medullary lesions. These can predominate in the gray substance, the posterior horns, be distributed in disseminated foci, and thus

FIG. 3.



Vessel of the white substance. Obliteration of the vascular trunk and compensatory development of capillaries in a nodule of infiltration of the external layer.

form the pseudo-systematic forms, recalling tabes, the anterior poliomyelitis, the multiple sclerosis, etc.

In the cases which we have examined, the lesions were usually more marked in the external coat of the vessels, and almost exclusively limited to this in the first stages of the process. In our cases it has seemed as though the middle coat and the elastic membrane offered a marked resistance to the infiltration, and it was only in cases of lesions very advanced that these were found involved. Small hemorrhagic foci are found in some places between the coats of the vessel's wall. We consider that there are two foci of origin for the vascular lesion,—from the intima and from the vasa vasorum,—for the syphilitic blood can act as well on the intima as on the endothelium of the nourishing capillaries; but we cannot agree with Heubner in thinking that usually the internal coat is the first affected,—we ascribe this priority to the external tunic, which is usually also the most involved by the lesion. However, the point of origin is of little importance, the endarteritis is the important lesion, since to this is due the contraction of the vessel, which can be the cause of thrombus formation.

In the cases which we have studied, where the affection was very recent the veins were more involved than the arteries. The infiltration begins in the exterior layer, but soon extends to the whole wall, which offers less resistance than the arterial wall. The vascular lesions are at first especially developed in the peripheral parts of the cord and in the pia, they involve also the free vessels in the subarachnoid cavity. The small peripheral end arteries of the cord take part in the process, and their lumina are often obliterated. The arterial or venous nature of the small altered vessels is very hard to recognize, but whatever may be the system to which they belong, the thinness of their walls favors the progress of the infiltration.

The infiltration of the vessels is usually diffuse, but there is a tendency to form miliary nodules, which sometimes surround a giant cell; and giant cells are found also in circumscribed infiltration not of a nodular appearance. These gummatous nodules are especially developed in the veins, and give a prominence to the exterior of the vessel; they can be of considerable size and may form veritable gummata. The miliary gummata are observed even in the cord; they develop always around a capillary. The vessels often become later solid cords, consisting of a hyaline substance. The small nourishing vessels of the cord are especially involved, and their early destruction explains the production of degenerative lesions in the medullary tissue at a time when the large arterial trunks are still permeable, and even very little altered.

The meninges, especially the pia, take considerable part in the inflammation. The predilection of the syphilitic virus for the lymphatic system ought to be put by the side of the irritant action of the syphilitic blood to explain the localization of the inflammation in the external layers of the vessels and the participation of the lymphatic spaces of the pia and of the arachnoid cavity. This participation is proved by the development of the infiltration between the pia and arachnoid; likewise an altered condition of the floor of the fourth ventricle is often constituted. We emphasize the fact that the infiltration of the pia is especially developed about the vessels. In following the progress of the inflammation it is noticed that it begins in the vascular walls and the adjacent lymphatic sheaths, afterwards it extends gradually, gains the lymphatic system of the pia, and from this moment develops in a manner to a certain degree independent. It is logical to admit that the syphilitic poison arising in the vessels has its first influence on these vessels, spreads then in the lymphatic sheaths, and from there in the entire spinal lymphatic system. In some cases it appears as though the lesions were primarily meningitic, when the vessel is as though choked, but the study of the early forms, and the intensity of alteration of vessels freed from all adherence in the arachnoid cavity, prove well the vascular origin of the inflammation.

The alterations of the nervous parenchyma following the changes of the vessels can be progressive or consist in a rapid necrosis. The diminution of consistency appears often rapidly, but not always. There is an abundant exudate of an albuminous liquid, and often small capillary hemorrhages. This exudate strangles the constituents of the cord. The vessels, especially the veins, are dilated and filled with blood. When the cord is cut at the autopsy, the white substance is found diffuent, badly separated from the gray, and the latter is often deformed. Even when the necrosis has the disposition of a transverse lesion, the transverse extent of the cord is not entirely destroyed: it is especially the marginal zone which is involved and only in second place the gray substance.

A very frequent form in the distribution of the zones of degeneration is that which affects the peripheral part of the cord in a long extent. This

results from the inflammation predominating in the peripheral vessels which supply nutrition to the marginal zone; that in the gray substance of the altered region is often less intense.

The secondary degeneration of the direct pyramidal tract we have seen extend as far as the first sacral roots. It is probable the secondary degeneration appears between the nineteenth and thirty-second day. The anæmia of the cord is never as great as that of the brain. The sclerosis is always secondary,—is never the primary lesion. To examine the details of this structure the cuts should be treated with acetic acid and potash, which swell the neuroglia, afterwards washed with alcohol and ether, which remove the fatty products of the disintegration. In the posterior column this sclerosis is always proportionally more dense.

Is it possible that the nervous tissue once destroyed is capable of regeneration? It is very evident without making intervene the regeneration of the elements destroyed that certain conditions, as the limitation of a process at first extended and of a diffuse nature, or the return of the circulation after momentary disturbance of the equilibrium in the parts not yet smitten with death, can explain the amelioration which one observes after the period of grave accidents is once passed. But one sees patients improve, after having presented during months and years the phenomena of intense spastic paraplegia with extreme contracture, producing even functional impotence, and at the end of a long period of very slow and progressive amelioration attain a state quite satisfactory. It is possible that the regeneration of the nerve-tubes plays an important rôle in this amelioration. Experiments on animals after section of the cord have shown reparation of the nervous substance and return of function; and we believe that for the nerve-tubes at least the regeneration is possible, for the nerve-cells the point is disputable. These elements once destroyed, no trophic power can intervene for their reproduction. The nerve-tubes are only conductors, the existence of which is subordinate to that of the trophic centres from which they emanate. In the cord as in the peripheral nerves they are capable of regenerating as long as this centre persists, provided that the cause of destruction which involves their course ceases to exist. In the medullary softening from syphilitic lesions of the vessels, the anæmia, however intense it may be at first, does not persist completely, and the vitality returns partly in the altered regions. The neuroglia sclerosis remains as an obstruction to the re-establishment of the normal structure, but this process is only secondary, it does not attack directly the nervous elements, it replaces them only after their destruction. It ceases to form when the degeneration is arrested. The dense sclerosis cannot be penetrated by the axis cylinders of new formation. In examining carefully the ancient cases of spinal syphilis small axis cylinders are found, isolated, clearly rounded, perfectly colored, and surrounded by very thin sheaths of myelin or else naked. It is hard to say if these represent new tubes in process of formation. We state only that an affirmative response

would accord with the clinical facts. "The clinic," says Leyden, "causes us to consider as probable the faculty of regeneration of the cord in man without proving it in a precise manner. Following wounds, hemorrhages, softenings, it is not rare to constitute gradual amelioration so striking that it is necessary to admit a partial regeneration."

We insist on the fact that if the infiltration of round cells about the vessels in the pia or cord have an extreme importance as characteristic of the process, they are only slightly developed, and often late; the principal lesion is the anæmic necrosis of the nervous parenchyma. The cicatrization of this infiltration takes the aspect of very dense connective tissue, often disposed as a wedge, with its base on the pia, with which tissue it is continuous.

There are lesions which directly affect the roots, produce direct symptoms, and cause secondary degeneration in the cord. For the anterior roots there is the secondary degeneration due to alteration of the cells in the anterior horns, but the radicular lesions are especially a direct consequence of the inflammation which invades the vascular, lymphatic, and connective tissues of the roots. Here one finds the point of departure of the infiltration in the walls of the vessels, it insinuates itself in the interfascicular connective-tissue spaces, and invades thus the body of the root. The destruction of the nerve-tubes here seems rather to result from the progressive invasion by the infiltration than from the circulatory troubles.

In the forms which terminate by rapid death when the infiltration is not yet much developed, and rests localized to the perivascular regions, the roots are little altered while the necrosis of the cord is intense. On the contrary, when a certain duration of the affection has permitted the extension of the inflammation, the perineurium is thickened and infiltrated, the nerve-tubes are destroyed by the infiltration, which invades the body of the root. Later, when the lesions are cicatrized the root is composed of a sclerotic tissue which differs from the neuroglia sclerosis of the cord in the predominance of the connective tissue element. The alterations of the roots are usually little accentuated; however, in certain cases they assume a capital importance, and some authors have admitted a special form of neuritis and perineuritis.

SYMPTOMS.

As the lesions are multiple the symptoms are the same, but as the vascular changes have a certain fixity, there is a resemblance between the different clinical types corresponding to these lesions. Still there are variations in the common form due to more or less rapidity of the process, the portion and extent of cord affected, the presence of alterations in the brain, etc. The vascular changes can predominate in a certain system of vessels, and produce the symptoms of a systematic affection of the cord. By most writers the medullary syphilis of the ordinary type is divided into acute and chronic, which correspond almost to the terms grave and benign. Intensity and rapidity are usually associated characteristics, but not in-

separable. Usually it is the great extent of the vascular lesions which determines in the cord the changes at the same time rapid and extensive; still a lesion developed rapidly may be circumscribed, and the symptoms after a stormy beginning may moderate and yield to a benign form. Likewise the progressive alterations may invade extensive regions, and the case then becomes more acute.

The acute form is associated with flaccid paralysis, muscular atrophy, and grave trophic troubles; on the other hand, the spastic phenomena characterize the chronic forms.

Vinache¹ describes the first symptoms as a sense of torpor or heaviness, irradiated pains in the legs and body, and genito-urinary difficulty. He speaks of vacillating march, the "fragmentation" of symptoms, and of the predominance of motor troubles.

According to Hammond,² there is a slow form, beginning with pains irradiated from the vertebral region towards the extremities, and characterized by a muscular stiffness of gradual development. Then occurs the paraplegia, beginning first in one leg, later involving both. Sensation is only slightly affected; the sphincters do not act normally. Anæsthesia and trophic disturbance appear late. The recovery is slow. But the paralysis may appear rapidly, and be the first symptom excepting some vague indications.

A transitory circulatory trouble can be the origin of a flaccid paralysis, which does not persist if the anæmia has not existed long enough to cause a necrosis of the nervous tissue. This is the same as the paralysis of cerebral origin from cerebral arteritis. The symptoms, though never absolutely unilateral, can predominate in one side.

The rapid form begins often with pain, and the paralytic phenomena appear quickly, the motor and sensory troubles soon attain their maximum, the sphincters participate in the paralysis (first retention, then incontinence), the reflexes are abolished, and decubitus appears.

Erb has sketched a form in which the gait is that of spastic paraplegia, the reflexes are exaggerated, but the contracture is moderate, the bladder is always involved, sensation is only slightly altered. There are no severe pains, muscular atrophy fails, arms, head, cranial nerves are free. The affection is progressive. There exist paræsthesia, temporary pains, lassitude, weakness, and stiffness of the legs. The spastic paresis may be great, rarely is there complete paralysis. It is remarkable that the contracture is so slight. The tendency is to amelioration, especially with energetic treatment, and improvement is found in about half the cases. Erb likewise speaks of a rapid evolution in some cases and paraplegia in a few days. We believe this simply indicates a more rapid extension, and we believe also that the constancy of Erb's form is due to the constancy of the location

¹ Vinache, Thèse, Paris, 1880.

² Hammond, A Treatise on the Diseases of the Nervous System, 1880.

of the lesion. The centres of the lumbar cord are not destroyed. If the transverse lesion is produced abruptly, it causes a flaccid paralysis, later a spastic form.

Erb's type is realized only when the lesion permits the survival of the patient for a sufficient period, and under certain other conditions.

We understand the clinical picture to be due to the vascular alterations primarily. The first symptoms of spinal syphilis are insidious, in other cases the *début* is rapid, or again it may be more gradual. Much oftener we find after a period of diffuse symptoms an abrupt aggravation in form of an attack of paraplegia, which either persists and is soon followed by death, or else there is improvement with spastic symptoms. It is not necessary for this spastic period to be preceded by an attack of paraplegia. In the premonitory period there are diffuse circulatory troubles; the meninges may be involved and likewise the roots. Frequently there are cerebral symptoms, for cerebrum and cord are one, and are equally exposed to the syphilitic blood, or rather the cerebrum is more so. In the beginning cerebral symptoms are usually present, such as early headache, temporary ocular troubles, paralysis, etc. These, with spinal symptoms, have diagnostic value; they do not indicate a descent from brain to cord, as Jürgens believes, but simply that the brain was first involved. There is a certain opposition between brain and cord, a persistent paralysis from cerebral softening is not followed immediately by spinal paralysis of the same intensity. The alteration oscillates on the cerebro-spinal axis, but once fixed it exhausts itself at this point.

PERIOD OF PREMONITORY SYMPTOMS.

The usual premonitory cerebral symptoms are more or less violent headache, vertigo, vomiting, diplopia, with temporary ocular paralysis, possibly trouble of vision, sometimes violent delirium, loss of consciousness, coma, intellectual disturbance. The principal character of these lesions is diffusion and fluctuation. For spinal symptoms there are often first the disturbances in the sensation, pains in the back, loins, and limbs, and paræsthesia. Pains in the loins may be slight, but increased by every movement, even that of the head. Others suffer more when lying down. It is exceptional to find the pains atrocious, though they are often more intense during the night, as seen in the nocturnal cephalalgia. The location in the loins, or the dorsal region between the shoulders, is more common than in the cervical or sacral regions. The pain may be present only on pressure, or it may exist in the form of a girdle, or be less severe in the lower extremities than in the back, for shooting pains are exceptional. Usually there are tingling, numbness, sensation of warmth or cold, and little or no loss of objective sensibility at first. The motor disturbances are usually in the lower extremities, and may consist in rigidity, especially after repose, feebleness, increased reflexes,—these, however, may be decreased or vary from day to day. The sphincter troubles are often early and of diagnostic value,

in connection with light and fluctuating disturbance of motion and sensation. They may be the first symptoms. While usually insidious and progressive in development they can at times be rapid or sudden, being in such cases usually preceded by disturbance in motion or sensation, but this is not always true, and then such unannounced sphincter difficulty is generally followed by rapid paralysis of the extremities. Before the condition of impossibility to urinate there is usually the waiting, the pressing, the "hesitation." Frequently there is a slight retention, with impulse to repeated micturition. Then there are the troubles of the genital system. That which is characteristic of the premonitory period is the extreme fluctuation of the symptoms and their diffusion, due to the circulatory lesions. Dejerine relates a case of syphilitic claudication,—inability to walk after going a short distance. There is only one symptom which offers a certain permanence, and that is the pain in the back, which is due to inflammation of the meninges, and is found especially in the slow forms when the perivascular inflammation extends to neighboring parts. This is usually absent or slight, in the rapid form, because the anæmic necrosis of the nervous tissue comes before the involvement of the meninges. This premonitory period is variable in time, rarely lasts many years, usually is of a duration reckoned by weeks, and may be interspersed with periods of considerable improvement.

PERIOD OF ORGANIC CHANGES IN THE CORD PARENCHYMA.

A time arrives when the nervous tissue is no longer altered functionally but organically; this may be gradual or acute in development. Ordinarily the premonitory symptoms become gradually worse, and one day after some sudden exertion the legs of the patient refuse to sustain him, he has time to support himself by a table or to drag himself to a bench, often after some moments he is able to rise, or in other cases it is only after some days his legs resume their function. This accident may repeat itself several times before permanent paralysis occurs, and may be associated with transitory retention of urine. These transitory paralyses are usually in the daytime. It is a kind of syncope of the cord, which being badly nourished is not equal to exertion. Nocturnal accidents are more grave and more permanent.

The permanent attacks come in the same manner as the premonitory, the patient rarely falls as though struck by lightning, rarely is there loss of consciousness; usually the recollection of the event is perfect. The paralysis often comes during the night, the patient awakens paralyzed in the legs, and there has been no warning during sleep; the same is seen in cerebral paralysis. Sometimes the paraplegia may require several days for its development, and then usually begins in one limb alone, and may be limited to this for several days. The clinical picture of the mode of beginning is often varied. When the paralysis is once established there remains usually the power of movement of the toes and of slow flexion of the

leg, with inability to raise the heel. At this time the paralysis is flaccid; this does not mean a destruction of centres, but is due to decreased circulation. To the same cause are due the muscular twitchings, which indicate irritation of reflex centres. It is seldom that reflex activity is so great as to cause at once permanent contracture, but at the end of some weeks in bed the legs are found in extension or demiflexion with great rigidity. Often the muscles of the lower part of the trunk are affected in this paralysis, and the patient is unable to sit up in bed, or to maintain himself thus when he has been so placed. If the paralysis remains flaccid, the paralyzed muscles lose their tonus and become soft.

The objective sensation is always altered at the moment when the paraplegia begins, and there may be complete anæsthesia in the affected parts, or it may be moderate or even partial,—*i.e.*, affecting certain qualities; but disturbance of sensation is always less than that of motion. There may be hyperæsthesia: the slightest touch of the skin may be painful, and this in close proximity to zones where pinching and pricking are hardly perceived. There may be paræsthesia, and one of our cases, at the moment of commencement of the paraplegia, felt a blow on the calves of the legs as if from a whip. The severity of the pain in the back is not in proportion to the gravity of the paralysis. The troubles of the sphincters are never absent in the permanent paralysis. The three great characteristics of the clinical picture at the *début* are the symptoms affecting motion, sensation, and the sphincters. At the beginning of the paralysis there is ordinarily no marked reaction, no fever, and the organic functions (except those of the sphincters) are as usual; sometimes the pulse is full, and there may be shivering, vertigo, vomiting, general malaise, and sensation of choking.

Death sometimes occurs in the first day of the attack, due to the extent of the lesion in the cord or to involvement of vital centres, and then we find signs of acute bulbar paralysis, precipitate and interrupted respiration, cardiac accidents, hiccough, and death occurs before decubitus develops; but this rapid termination is exceptional, and usually there is a period of longer duration. If the paraplegia is light, amelioration may set in early, and the patient enter almost at once into the condition of spastic paraplegia.

In the grave forms decubitus soon develops, and if death does not occur in the first days (this event is exceptional), the symptoms persist, and either the reflexes remain lost or rigidity occurs. The troubles of sensation seldom remain as grave as at first, it is rather an attenuation for all forms, or sometimes one quality is principally involved,—touch, pain, temperature, etc. The persistence of anæsthesia is a grave sign, likewise the aggravation of this, for such anæsthesia manifests itself only in cases of great destruction of an extended segment of the cord. There is atrophy of the paralyzed muscles to a certain measure, due to destruction of the motor cells, and this is accompanied by reaction of degeneration. Idio-muscular contractions are at first exaggerated, but, as the atrophy increases, they weaken or disappear. The atrophy is especially in the lower extremities, but may be as

great in the lower part of the trunk ; it is, however, often hidden here by adipose tissue, or else it is considered simple emaciation. It would seem that the destruction of the gray substance of the dorsal region has less severe consequences in point of view of the nutrition of the muscles than has destruction of the cervical or lumbar centres. The decubitus has been noted in regions free from pressure, and often trophic lesions have also been described. Death, after the paralysis, is usually from marasmus, or purulent infection, or other complication. At times there is improvement, even after symptoms of intense degree, instead of death. The absence of marked atrophy and the presence of contractures, even if only moderate, are good signs, for they indicate that the lumbar cord has not been destroyed.

PERIOD OF SPASTIC PARAPLEGIA.

In the period of spastic paraplegia the spinal centres for the sphincters, like those for movement of the lower limbs, are cut off from cerebral impulse, but react to peripheral, and so a patient may not be able to extend the limbs, which are rigid in demiflexion, but is able to accomplish this movement by scratching vigorously with the nails the skin of the anterior surface of the thigh, while another patient performs urination by pinching the skin of the abdomen. Obstinate constipation may yield to diarrhoea and fæcal incontinence for a time. Muscular contractions may occur spontaneously in the lower limbs, and cause the patient to jump in his bed, and sometimes awaken him at night ; they may occur from the least irritation, as the jarring of his bed. Sometimes there are veritable crises of contractions: the limbs, moderately stiff, extend or flex slowly without the control of the patient, his attempts to prevent them only increasing them. Although the anæsthesia may have been complete at the beginning, it is never so at this period, for by this time it has become modified. Usually there is a perversion of sensation, a hyperæsthesia, perhaps only for certain forms of irritation.

Lumbar pains are rarely noticed in the period of spastic paraplegia ; usually it is a numbness or coldness in the legs which is complained of. The patient may be confined to his bed for years, with the upper extremities, the cranial nerves, and the intelligence normal, but usually this intense paralysis is absent. As a rule, the voluntary movements are free from incoördination, but are performed as if the patient worked by springs. Sometimes the muscular rigidity is slight as long as the person remains in bed, but the latent contracture shows when he gets up, and when sitting it may be difficult to separate the knees, and one leg can be crossed over the other only with the aid of the hands. This is not weakness, as is proved when he resists communicated movement. The rigidity in the act of walking may become so great that the hips are fixed by the contractions, and the gait is like that of a duck. There are forms where certain symptoms of tabes are joined to the spastic paraplegia.

The evolution occurs as follows : Some months or a few years after the

sypilitic infection the patient experiences the premonitory symptoms, and later a paralytic attack, which may attain its maximum in some hours; or if this attack aborts the previous symptoms become more severe, and he is confined to his bed. In moderate forms, at the end of from four to ten months the grave symptoms have disappeared, and the patient has entered on the stage of spastic paraplegia.

In some cases of superacute form the prodromic period fails, or passes unnoticed, and the patient is stricken with an apoplectic attack, and death follows after ten days or two months. In other cases there is a slow progression to spastic paraplegia, uninterrupted by accidents.

There are forms which never go beyond the premonitory stage. When the stationary period has been attained relapses are not common. Death is common in the acute forms.

The persistence of the chronic state of spastic paraplegia is due to sclerosis of the cord; therefore recovery is rare if the disease has progressed beyond the vascular stage.

There are some cases of superacute *début* which begin in a most grave form, ameliorate for some days or weeks, and even end in complete recovery. The only explanation is, that a large portion of the cord has been involved in the vascular lesion at one time without the anæmia having been sufficient to destroy the vitality. This is equally true of certain forms of hemiplegia of cerebral origin, and they could be called functional.

The acute forms are those in which the greater part of the cord is involved; the chronic those in which the lesion is transverse and with the lumbar swelling free. Although the lesion is principally in the white substance, the gray matter is never intact. When the modifications of tissue at the seat of trouble are slight and disseminated, the sclerosis of the column of Goll and of the lateral columns presents the appearance of primary degeneration of these tracts,—i.e., of a combined sclerosis. The primary lesions, although scattered, are sufficient to destroy many nerve-tubes.

The location of the trouble in the lumbar cord produces a flaccid paralysis, atrophy, anæsthesia, etc., and differs from the ordinary location in the severity of the symptoms and in early death.

PSEUDO-SYSTEMATIC FORMS.

Syphilis may produce systematic myelitis, the anatomical process of which is different from the myelopathy which we have been studying; clinically there is also a difference between the true systematic affections and those which result from the predominance of diffuse lesions in certain systems of the spinal axis. Ordinary tabes may be more or less faithfully simulated; likewise muscular atrophy, contracture, and tremor; the cephalic phenomena may, by their predominance or association, recall anterior poliomyelitis, multiple sclerosis, lateral sclerosis, etc. The tabetic form may follow an attack of paraplegia, or may develop progressively, and closely resemble true tabes; still there are usually certain atypical features.

The form of combined tabes is the most common, in which spastic and tabetic elements are united. The pseudo-tabes can be distinguished from the true by the mode of *début* and evolution, which are more rapid, by the frequency of acute accidents, and by reaction to specific treatment.

Sometimes the syphilitic lesions appear almost entirely limited to the lateral columns, and the degeneration is in the direct cerebellar and the pyramidal tracts, simulating a primary lateral sclerosis; but on the whole this form is so slightly distinguished clinically, and by distribution of the lesions, from the ordinary form that it hardly merits to be considered apart.

Muscular atrophy is common in the grave forms, especially in the period which follows the attack of paraplegia, and foretells the persistence of grave symptoms, for it announces the destruction of motor cells. In the forms which terminate in death, the atrophy is usually pronounced if it has had time to develop; on the other hand, in the forms which terminate in spastic paraplegia this symptom often fails. In some cases the muscular atrophy presents a special form of the disease; and yet there are usually certain features which distinguish it from true poliomyelitis, as lumbar and peripheral pains, spastic phenomena, trouble of the sphincters. The question arises whether syphilis can act directly on the motor cells as it is believed to act on the posterior columns in tabes, and be one of the causes of progressive poliomyelitis. Siemerling believes that the alteration of the cells results from hemorrhage, softening, or round-cell infiltration, and we must express our view as favoring the opinion that it is of secondary origin, and probably in most cases due to alteration of the nourishing vessels of the gray substance. The vascular lesions of the gray horns are the chief disturbance in these cases, the alteration of the medullary tissue elsewhere, although it exists, being, by reason of its minor importance, of secondary rank. This form may develop more or less rapidly, and thus produce the acute or chronic poliomyelitis.

In certain cases the symptoms can be grouped, and assume then the form of bulbar paralysis. This is only a question of location, not of difference in the lesions.

The gummata of the cord do not cause any sign especially characteristic; as an exclusive lesion it probably produces the symptoms of slow compression. It would seem that it ought to cause the appearance of demisection of the cord, but clinical observation does not support this. One is inclined to make such a diagnosis in the clinical picture of a hemilesion in a syphilitic person, especially if amelioration is obtained by specific treatment; but in the case reported by Charcot and Gombault, which presented this form in all its purity, the autopsy revealed the existence of unilateral lesion, but not a gumma. Gummatous or fibrous thickening may occur at any region of the cord, and sometimes this involves the cauda equina, and the cord above escapes.

Fournier has described a syphilitic neurasthenia, consisting in intense headache, trouble of sensation, hyperæsthesia, anæsthesia, neuralgic pains, a

little everywhere, weak legs, sometimes exaggerated reflexes ; but there are no organic signs, no vesical nor oculo-pupillary troubles ; it resists specific treatment, is especially diurnal, and sometimes true hysterical signs are present.

While the abrupt *début* of the paraplegia is characteristic to a certain point, especially if preceded by vacillating symptoms, still such paraplegia does not necessarily mean softening in the cord, for a lesion near the cord, of slow development, may cause this, as shown in a case observed by Dejerine, where a syphilitic patient was afflicted with rapid paraplegia, muscular atrophy, vesical and rectal trouble, decubitus, and at the autopsy a sarcoma was found on the vertebral column, and compressing the cord.

Hysterical paraplegia can give a picture very hard to diagnose from the syphilitic form ; the same is true of certain cases of multiple sclerosis. One must likewise be on his guard in diagnosing a polyneuritis as a syphilitic spinal atrophy, but usually spastic signs fail, and the sphincters are not involved. The syphilis may be spastic, with muscular atrophy and dissociation in the sensation, and thus closely resemble syringomyelia ; but the rapid and oscillating march and the coexistence of other symptoms indicate a diffuse lesion.

As for prognosis, if the lesion is confined to the vessels and meninges, the specific treatment can accomplish much ; later it has little action on the lesion already produced, but can prevent further development. The treatment should be vigorous at the first appearance of involvement of nerve tissue, three to six grammes of mercurial ointment daily, with hygienic precautions ; likewise four to six grammes daily of the iodide of potassium.

If the symptoms develop slowly there is more hope of arresting the process by treatment. The prognosis is more grave when the location is cervical, and more so when lumbar than when dorsal.

Although the acute onset is very dangerous, there may even then be almost complete recovery. The signs of danger are bulbar involvement, respiratory trouble, paralysis of the diaphragm, grave trophic trouble, purulent cystitis with albuminuria, and especially hectic fever. Under such circumstances the mercury should be stopped and the iodide of potassium alone given, but if the primary symptoms return it is well to resume the mixed treatment.

As to the frequency of syphilis of the cord opinions differ : usually it is considered a rare location. Among one thousand and eighty-five cases of syphilis of the nervous system recorded by Fournier, only seventy-seven cases were purely spinal, and four hundred and sixteen cerebro-spinal. Erb believes syphilitic paraplegia to be ten times less frequent than tabes. This paraplegia is sometimes very early, sometimes late, more frequently it is near the period of infection. There is no relation between the severity of the infection and the spinal location ; the weight of opinion is towards a previous mild manifestation, and our own opinion, derived from the cases we have observed, agrees with this.

The neuropathic heredity does not seem to play an important rôle in the spinal location. The exaggeration of the vulnerability of nervous tissue by hereditary predisposition favors the development of parenchymatous affections, but this etiological factor does not seem to enter into count when it has to do with inflammatory lesions involving interstitial tissue. The heredity is shown in another manner,—by the transmission of the specific germ; and although nervous affections are rare manifestations of hereditary syphilis, they can be found in the cord. The male sex furnishes the greater number of cases of syphilitic paraplegia, and the same is true of every paraplegia, not because of the rarity of syphilis in females, but because of the excesses, overwork, etc., which are more common in the male sex. It is more common before middle age, for, as it appears soon after the infection, it is natural that it should occur at a period when infection is most common.

Rheumatism seems to be an important predisposing cause, according to some authors, likewise overwork, cold, traumatism; but we are not disposed to ascribe the vascular and meningitic location to these occasional conditions, although when the primary lesions are once established they may have important influence. In the precarious state in which the circulation of the cord is, the least excess becomes overwork for a tissue where nutrition is already deficient.

We would form our conclusions as follows:

1. Syphilis can act on the nervous system in two ways:

First, directly; in attacking the parenchyma, it determines thus at the *début* of the affection the first vague nervous troubles of the secondary period, and later, perhaps, certain systematic affections, as tabes. This mode of action is not clearly explained, for there are no anatomical characteristics which permit us to recognize the origin of the affections which are attributed to it.

Second, indirectly, in producing an inflammation of the vascular, lymphatic, and connective-tissue elements. The alteration of the parenchyma is secondary to these lesions. The reality of this process cannot be disputed, it is affirmed by the aspect of the inflammatory lesions, which, although not special to syphilis, are, nevertheless, to a certain point characteristic of this affection. The process can strike all parts of the cerebro-spinal system, but is limited sometimes exclusively to the cord.

2. Syphilis of the cord appears at a period near that of infection, with a maximum between the end of the first year and the end of the sixth, and is much more frequent in men.

3. The inflammation begins with the vascular walls and perivascular regions and involves especially the small vessels of the periphery of the cord. In the large vessels it involves the internal, and especially the external tunic, developing about the vasa vasorum. From this point it involves the perivascular lymph-space, afterwards the lymphatic system of the meninges, and finally the entire arachnoid cavity. The infection spreads by the circulatory system, and rapidly in the lymphatic system, where it assumes an independent form. At this period the lesions are constituted by:

An inflammation of the vascular walls, which attains its maximum in the veins and small vessels.

A diffuse general infiltration of the connective tissue of the meninges.

An irritation of all the surfaces bathed by the cerebro-spinal fluid (surfaces of the meninges, ventricular walls).

These inflammatory lesions are characterized by a tendency to nodular formations (miliary gummata of the meninges, of the vessels, of the cord).

4. The alterations of the nervous parenchyma, the essential elements, and of the neuroglia are secondary; they may result from imperfect nutrition, on account of the vascular lesions of the cord and of the nourishing membrane, or from an invasion of the medullary parenchyma by the specific infiltration. The first is the more important cause.

5. According to the intensity, the distribution, and the rapidity of evolution of the primary lesions, the anæmic necrosis of the nervous tissue appears abruptly, as a transverse softening, which may be located at different points of the cord or predominate in one or the other vascular department; or else it appears slowly, and then the destruction is accompanied by a process of substitutive reaction of the neuroglia, which replaces the destroyed elements. This period of substitution is favored by the partial return of the circulation (collateral circulation, development of the vasa vasorum, formation of new capillaries in the obliterated vessels), and terminates in the neuroglia sclerosis. The connective tissue which enters the cord with the vessels is also thickened.

6. Although the necrobiotic lesions followed by sclerosis constitute the principal alteration, there are certain medullary and especially radicular changes, which result from the invasion of the nervous tissue by an infiltration extending from a point in the meninges or a perivascular sheath. This process can in certain cases assume a considerable importance.

7. While the lesions preserve the same characters, they may vary in their distribution. They are generally diffuse, but they sometimes assume the aspect of a transverse lesion, more or less intense, more or less limited, and located at different heights of the cord.

They can be distributed more irregularly in a considerable extent of the cord. In every case they are more marked in the marginal zone. The dorsal location is the most frequent.

Be the lesions confluent or be they disseminated, the result is always the same, and they produce the effect of a transverse lesion, accompanied by a secondary degeneration ascending and descending. The lesions involve especially the territory of the postero-lateral spinal vascular system. They may predominate in certain regions of the cord,—the lateral columns, the posterior columns, the gray substance of the anterior horns,—and thus simulate certain systematic affections.

8. The ordinary clinical evolution is the following: At the period of formation of the primary vascular lesions and of those of the meninges, there are diffuse premonitory phenomena.

At the period of softening and of degeneration of the nervous elements, there is an attack of paraplegia, followed by paralytic phenomena and grave trophic troubles.

At the period of sclerosis there is the chronic spastic paraplegia.

The abrupt *début* can be manifested without being preceded by a prodromic phase, or in other cases the spastic paraplegia comes slowly without passing through the acute stage.

9. Death may occur either in the first period of the affection from the localization or extent of the lesions, or more slowly from the progress of the affection or from a complication.

The ordinary termination of the affection is a spastic paraplegia persisting in a chronic state after an amelioration more or less marked.

The complete recovery is only possible in certain conditions, when the primary vascular and meningitic lesions have been arrested before the final destruction of the nervous parenchyma.

The reorganization of the necrosed nervous tissue, if it is possible, is manifested only in a limited degree.

10. In certain conditions the primary inflammation is accentuated in the meninges, producing a meningitis or a pachymeningitis, or else it assumes the form of a circumscribed gummatous neoplasm.

11. The iodo-mercurial treatment is demanded at the appearance of the first symptoms. It acts only on the primary inflammatory productions, and is without influence on the necrobiotic lesions once established.

12. The medullary syphilis is always a serious affection. Death may intervene in spite of treatment, especially in the acute forms. Outside of certain rare fortunate cases where complete recovery is obtained, the amelioration never goes beyond a certain limit, which is fixed on account of an incurable sclerotic cicatrice of the cord.

SOME OBSERVATIONS WHICH APPEAR TO ESTABLISH THE AERIAL TRANSPORTATION OF MALARIAL GERMS.¹

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AN interesting paper read before this society last year by Dr. Wm. H. Daly, of Pittsburg, setting forth the fact that malarial diseases may be and, in Dr. Daly's opinion, ordinarily are disseminated by drinking water con-

¹ Read before the American Climatological Association at Hot Springs, Va., June 13, 1895.

taining the germs of the disease, has aroused some discussion and has arrested the attention of a number of medical men.

The controversy as to whether malaria comes from the air we breathe or the water we drink is by no means new. In fact, it is as old as medicine itself. According to Major Smart,¹ Hippocrates believed that the manifestations of malarial diseases were due to the use of marshy waters; but Galen and Avicenna recognized the existence of a marsh-poison which contaminated the air. In 1831, Orton,² in his work on cholera, instanced the unenlightened state of the Hindoo mind, inasmuch as they believed that malarious diseases came from bad drinking water. Sir Joseph Fayrer³ also mentions this belief of the natives of India in his celebrated Croonian lectures of 1882, and adds that they also believe that the milk of buffaloes or cows pastured in places overflowed by waters containing the malarial poison has the same effect in producing the disease as the waters themselves. As we are not informed of the dairy methods of the Hindoos, we cannot judge whether the milk may be contaminated by water subsequently to milking or not. We infer, however, that it may become noxious in this way.

The case of the soldiers on the transport "Argo," in the year 1834, recorded by M. Boudin,⁴ is familiar to most of you, and clearly shows that the cause of the outbreak of malarial fever upon the vessel was the marsh water, which those affected drank, and which those who escaped the fever did not drink. And so strong was the chain of evidence in this case that M. Colin,⁴ who was convinced that malarial infection was solely conveyed by the air, was obliged to dispute the diagnosis and assert that the fevers were cases of typhus,—a quite unwarranted assumption.

Many observers, especially Sir J. Fayrer,³ Surgeon E. G. Russell¹ (in his work on "Malaria and Diseases of the Spleen," Calcutta, 1880), Hehir,⁵ Sternberg,⁶ Smart,⁷ Parkes,⁴ Moore⁴ ("Diseases of India," London, 1861), agree that the malarial poison may enter the system with the drinking water. Dr. Smart⁷ refers to the great improvement in the health of the garrison at Fort Brown, Texas, especially in the matter of malarial diseases, since a better water-supply has been obtained and the troops no longer drink the Rio Grande River water. Dr. M. K. Taylor⁴ made similar statements with respect to Fort Sill, Indian Territory, in a paper read before the International Medical Congress at Washington some years ago. Dr. Richard Waggoner,⁷ of Pensacola, Fla., gives a number of instances which show that the malarial diseases in his neighborhood depend upon the drinking water. Cases like those of Dr. Jones,⁶ recently reported, of Drs. Norburg,⁶ Lewis,⁷ Daly,⁶ Lumsden,⁶ Boyker,⁶ etc., show undoubted contamination of the drinking water and the propagation of malarious disease by this means.

Professor Bemis,²³ of New Orleans, has shown that the poison of malaria may live in the water an indefinite and undetermined time, and be conveyed by water currents through immense distances and even to remote islands

and continents. Smart⁴ tells us that the disappearance of malarial disease from a locality has evidently been often associated with the substitution of percolated water for surface supplies. The Terrai, a belt of marshy country lying along the base of the Himalaya Mountains, has recently been reclaimed and made habitable by the use of deep wells. The testimony shows that in this tract the chief cause of the malarial fevers lay in the surface waters which had been used as a drinking supply. Parkes⁴ says, "One very important circumstance is the rapidity of development of malarious disease and its fatality when introduced in water. It is the same thing as in the case of diarrhoea and dysentery. Either the fever-making cause must be in larger quantity in the water or, what is equally probable, must be more readily taken up into the circulation and carried to the spleen than when the cause enters by the lungs."

Dr. von Wedekind,⁶ U. S. Navy, states that it is a common practice for medical officers serving on the West African coast to forbid entirely the use of the "land water" as a beverage by the men under their charge, which might seem to some a reversion to the enlightened state of mind noticed in the Hindoos in 1831.

Hertz⁸ says that in colder climates, Germany, the Netherlands, Russia, etc., malarial fevers most commonly appear at the time of the melting snow. Dr. Smart⁹ showed that the malarious diseases affecting the troops at Fort Bridger, Wyo., increased in direct ratio with the organic impurities of the drinking water, and were especially prevalent when melted snow-water found its way into the stream from which the drinking water was derived.

My friend, Dr. Atkins, of East Las Vegas, New Mexico, noted, in the spring of 1894, a violent dust-storm from Deming, New Mexico, to the Raton Mountains. He says, "After the storm had raged all day in the Rio Grande Valley it was curious to see at 5 P.M. the very fine dust sailing high over the mountains west and southwest of Las Vegas coming from all New Mexico southwest of us. In such a way our water might have been infected."

The doctor had been suffering with a severe chill and fever, contracted, as he fancied, from the drinking water. He says further, "In Las Vegas and vicinity we have absolutely no malaria, no low or marshy places, but at Albuquerque and other Rio Grande points it exists." He also adds that the seasons of 1893 and 1894 had been unusually wet, after six or seven years of heat and drought, and in the fall of 1894 a few cases of what was apparently malarial fever and of typhoid fever, the first in three or four years, were noted. His conjecture of the aerial contamination of the water-supply of Las Vegas, which comes from a pond on the side of the mountain, over which the dust-storm blew, is reasonable and probably correct, although the pond water used for drinking might have been contaminated by the heavy rains. Rains after droughts are universally prone to cause malaria whether swamps or bogs are near by or not, and they probably do

this by sweeping organic matters into the water-supply. It is said by some, however, that these rains wash the malarial germs out of the air into the water.

Smart⁴ also mentions the fact that malarial hæmaturia, hemorrhagic malarial fever, etc., are prevalent in winter when atmospheric malarial exhalations could not be expected, and states that remittents and so-called typho-malarial fevers may occur when the temperature is below zero, and therefore must be supposed to come from the water.

Those of us whose practice lies in a growing community, where a public water-supply has been recently introduced, have all, I presume, noticed cases of disease of a malarious nature, the victims of which were still drinking from the "best well in town." Without referring to my case-books, I can recall a number of instances in which "malaria" disappeared from a household just as soon as they began drinking the "town water" and give up the ancestral well. Dr. Whitehorne, of Verona, New Jersey, called attention some years ago to the increased freedom from malarial diseases enjoyed by the inmates of the City Home, a correctional institution of Newark, New Jersey, since they had ceased drinking surface water. Dr. Harvey, in the same discussion, stated that, in his experience, malaria comes from the drinking water. Whether my cases above mentioned were true malarial diseases or not, I, for one, am somewhat doubtful. It is a very fortunate thing that the fact of the existence of the plasmodium in every case of true malarial poisoning seems to be proved. And it is to be hoped that the recent reports that each of the commoner forms of malarial fever has its distinct plasmodium will be verified. With this aid to diagnosis, the nature of many an obscure affection will probably be made manifest, and intelligent direction will be furnished for the action of health officers and sanitarians in the matter of water-supplies, drainage, etc.

The writer agrees with Dr. Daly,⁶ so far as this, that the text-books do not as a rule sufficiently emphasize the fact of malarial infection from drinking water. It is, perhaps, needless for me to remind you, however, that the probability of the aqueous spread of malaria is mentioned in Reynolds's "System of Medicine" (Dr. Maclean), Hare's "Therapeutics" (Dr. Dock), Pepper's "American Text-Book" (Professor Whittaker), Ziemssen's "Cyclopædia" (Hertz), Loomis's "Practical Medicine," Bristowe's "Theory and Practice of Medicine," Pepper's "System of Medicine" (Ed. 1884), Niemeyer's "Text-Book of Practical Medicine," "The Medical and Surgical History of the War of the Rebellion," and, turning to the writings of that noble clinician, Dr. George B. Wood, we read ("Practice of Medicine," part i. chap. ii.), "It is not impossible that they [the malarial miasmata] may be absorbed through the skin and even through the mucous membrane of the stomach, which they may enter with the saliva."

The writer remembers instances during his army service in New Mexico in which the consumption of watermelons seemed to be provocative of

malarial disease. I only mention this in passing, because Dr. Daly lays so much stress upon the chance of malarial poison being taken into the system by eating spinach, lettuce, and other fresh vegetables which may have been washed in marshy waters and may have the germs adhering to their surfaces. The possibility of the communication of malaria by the latter means or by the juices of fruits or melons grown in malarial soils is a question requiring further investigation. Dr. Cadwallader⁶ states that drinking the sap of the sugar-maple and eating sorghum molasses are probably sources of malarial fevers, and Hertz and others warn travellers against eating watery fruits while in malarious countries. Dr. Daly, in the paper referred to, seems to lay great stress upon the fact that he and his comrades were able to remain in the swamps for considerable periods without contracting ague, so long as they did not drink the marsh water. And the inference which he seems to wish to be drawn from this fact is that the air of the swamps does not contain malaria, and that, therefore, there is no aerial transmission of malaria. There is one fallacy in the doctor's position which he seems to have overlooked. The comparative immunity of those dwelling in swamps from chills and fever has been a matter of comment, and, I may say, of surprise, for a number of years. At any rate, Sir Thomas Watson noted, in his admirable lectures, the fact that among the inhabitants of the Dismal Swamp, malaria is never seen. Atkins¹¹ says, "It must also be admitted, however, that these diseases do not prevail in all marshy districts." Dr. Geo. H. Horn¹² reports an absence of malarial disease at Camp Independence, California, where every supposed factor for its propagation existed. Osler¹³ says that it is impossible to tell from the soil whether it is malarious or not. Sternberg¹⁰ said, in 1883, that there is still a factor in the development of malaria with which we are unacquainted and whose precise action we can only surmise.

Smart says that owing to local causes the vicinity of a marsh may not be an insalubrious locality, and in another place says that a swamp or marsh is not needed for the development of malarial diseases.

Singapore is a place whose freedom from malaria can be explained only by assuming that there is not sufficient change either daily or annually in the temperature to produce the radiation of heat necessary to set the malarial germ in motion.

Dr. Baker (Hare's "System of Therapeutics," vol. i. p. 536) tells us that "in many countries, through draining the soil, clearing of forests, *and other measures tending to reduce the difference between day and night atmospheric temperature*, there has been a very great reduction in the sickness from intermittent fevers."

The Amazon River, and many marshy localities in Australia, New Zealand, New Caledonia, South America, and the Bermudas are mentioned as free from malaria, where the contrary would be expected.

Rusby⁶ observed that in travelling in South America there is little danger in sleeping near stagnant pools, but that a sojourn near running

streams or water-falls was almost sure to be followed by a seizure. The editor of the *Medical Record*, in commenting upon this observation, says, "This would seem to argue in support of the theory advanced some time ago that the malarial poison is carried by running water from wooded regions, and that marshes are not its natural habitat."

Hertz⁸ says, "Instances occur every now and then in which, with every condition present for the development of malaria, this poison is entirely lacking." We cannot account for these exceptions unless it be on the ground of the disinfecting properties of ozone, which is said to be largely developed in some marshes.

If, then, the atmosphere of certain marshes is free from malaria, may not Dr. Daly and his friends have been hunting in such a marsh, and hence escaped the miasma, as soon as they desisted from drinking the water?

Having now considered the question of aqueous transmission of malaria, we turn to that of its aerial transmission. As hinted in the early part of this paper, belief in the latter proposition has always existed.

Pliny¹ noted the fact that trees destroy or consume mephitic vapors, and Galen and Avicenna recognized the existence of aerial contamination with marsh miasmata. Lancisi¹⁰ in 1695 published his "*De Noxiis Paludum Effluviis*," in which he proved the aerial origin of malarious disease, and this work was for years the great authority upon the subject, and still has an effect upon the medical mind.

Tomasi Crudeli,³ than whom probably no man living has made a more extended study of the natural history of malaria, showed a number of years ago that a perpendicular elevation of fifteen or twenty feet will stop the malarial current, but an object of the same height with inclined or sloping sides is not efficacious in arresting the passage of malaria. The same authority¹⁵ also points out that people sleeping on platforms three or four metres from the surface of the ground are comparatively safe from malarial disease. He also directs that the air of the morning and early evening hours be rigidly excluded from dwellings, especially if any excavation may be going on in the neighborhood. If possible, air to ventilate the house should not be taken from near the ground, but should come from a higher stratum. Flowers should also be rigidly excluded from houses in malarious regions.

Dr. W. O. Daniel¹⁶ recommended keeping the doors and windows shut as much as possible between sunrise and sunset, and states that excellent results have followed the execution of this plan.

Dr. John M. Ward,⁶ superintendent of the New Jersey State Lunatic Asylum, observed no case of malarial fever among six hundred and seventy-two inmates of the institution, all of whom were kept in-doors after sunset, whereas the laborers and assistants in the asylum, who were not so restricted, suffered with such diseases. Hartshorne²⁰ noted that the in-door operatives in factories in miasmatic regions enjoyed comparative immunity from malarial disease.

Dr. Geo. B. Wood¹⁷ stated that he was physician to a public institution containing more than one hundred inmates, among whom, during sickly seasons, autumnal fever was very prevalent until the order was enforced prohibiting any one from going out of doors before breakfast or after tea. We are told that screens or mosquito-nets will exclude malaria as well as insects.³

Stanley, in his well-known work "In Darkest Africa," says that Emin Pasha always took a mosquito-curtain with him, as he believed that it was an excellent protector against miasmatic exhalations of the night.

Stanley also says, "While ascending the Congo with the wind astern we were unusually exempted from ague. But descending the Upper Congo facing the wind, we were smitten with most severe forms of it; while ascending the Aruwini, we seldom thought of African fever, but descending it in canoes, meeting the wind currents and carried towards it by river flow and paddle, we were speedily made aware that acclimatization is slow." The Amazon¹⁴ is also free from malaria, compared to its tributaries, which fact is explained by the assertion that a wind constantly blowing up the wide stream from the sea tends to equalize the day and night temperature and to obviate the nocturnal radiation of heat. Another explanation might be that the sea-breeze drives back or neutralizes the malarial germs contained in the land breeze. The Orinoco,¹⁴ in South America, is a notoriously malarial stream and its great cataract is by far the worst portion. This cataract is surrounded by bare, black rocks and the radiation of heat is extreme. It is also true that the spray is dashed high and the malaria, originally in solution in the water, may be disseminated through the air by mechanical means as well as by the heat radiation. This view of the writer is confirmed by the opinion of Geo. B. Wood,¹⁴ who says, "the atmosphere may be impregnated with malarial poison by the spray of water in motion."

We might observe here, in passing, that the view seems to be daily gaining ground that malarious waters are often made so by the washing down of the malarial germs of the air into the water. Combe's¹⁸ experiments lend color to this view. He asserts, after four years' observations, that a light rain-fall lasting but an hour will purify the air completely of bacteria, and that after a snow-fall of a half hour the atmosphere remains completely freed from bacteria for a considerable time.

Smart¹ believes that rain-falls carry down the malarial germ from the air, and Geo. B. Wood and many others believe that malaria comes down with the dew.

It has been known since the time of Hippocrates that fires at night are an efficient means of keeping off malaria, their prophylactic action being due either to the prevention of the dew or to the creation of artificial currents of air and the intercepting of the established currents.

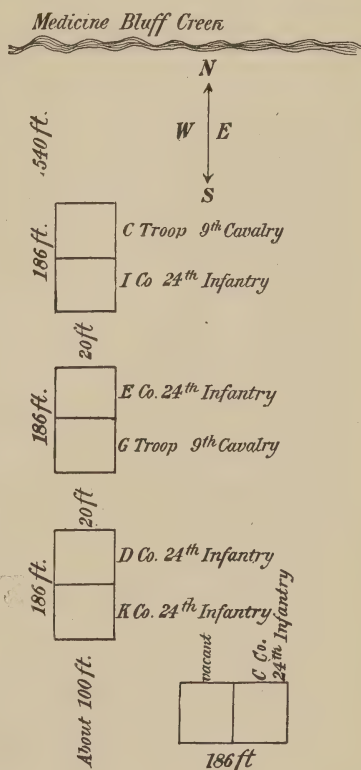
The fact of the carriage of malarial germs for long distances in the air is commonly believed by medical men living in malarial regions. Smart¹

says, "Many medical men of the Mississippi Valley are of the opinion that during an especially unhealthy season the miasm from the river bottom affects persons living on the generally healthy uplands twenty or thirty miles inland from the eastern shore, but not on the western side. This is accounted for by the direction of the wind, which blows generally across the valley from the west."

Macculloch thought that malaria was blown entirely across the English Channel from Holland.

In another place Smart says that it is well known that the insalubrity of Sierra Leone is due to the winds from the Great Bullam Swamp. The windward side of most swamps is wholesome and the leeward may be if there be an obstacle to the air currents.

I do not believe it desirable to take up your time with further quotations tending to show the aerial transmission of malaria. But, if you will pardon me, I will add a few of my own observations to those already given. I will quote from a paper which I published in the *Medical News*, Philadelphia, of July 5, 1884. The writer became post-surgeon in this post (Fort Sill, Indian Territory) in the latter part of February, 1883, and was relieved from this duty November 20, 1883. During this period (about nine months) he attended "sick call" himself (with less than two dozen exceptions) and took entire charge of the cases in the hospital. He therefore is certain that all the cases diagnosed as malarious received anti-periodic treatment, and believes that the diagnoses were correctly made. . . . Without doubt the hygiene of this fort is execrable, owing to the clayey soil and rank vegetation and to the disregard of every hygienic law evinced by the builders of the barracks. . . . All the barracks for the men are substantially similar. The accompanying diagram will show the disposition of these buildings as regards the creek, from which our water-supply comes, and the points of the compass. Each building is one hundred and eighty-six feet long and is divided equally by a transverse partition, each half accommodating one company of soldiers. The distance from the shore of the creek to the northern end of C Troop's, Ninth Cavalry, quarters is five hundred and forty feet. A passage-way of about twenty feet separates the three buildings, which run north and south from



each other. Nearly a hundred feet farther south is the barrack of C Company, Twenty-fourth Infantry. "Medicine Bluff Creek" is a stream of varying volume: the water has always more or less vegetable matter suspended in it. When the stream is swollen it widely overflows its banks, and subsiding deposits great quantities of dead leaves, grass, etc., in varying stages of decay along the banks, and even in the forks of trees and tops of bushes. The creek water is hauled about the post in a "water-wagon," and distributed for drinking and culinary purposes. It is kept in clean barrels and other receptacles.

The garrison of this fort is composed of six companies (until October 8th last there were seven) of colored troops. The prevailing wind is from the south. The next most frequent wind is the north wind, called here "Norther." It is always much colder than its opposite, and is popularly believed to bring more malaria. The direction of the winds at this post for the years 1880, 1881, and 1882, taken from the observations of the signal office here, are as follows: Three observations daily.

1880.		1881.		1882.	
Direction.	No. of Observations.	Direction.	No. of Observations.	Direction.	No. of Observations.
N.....	247	N.....	228	N.....	294
N.E.....	102	N.E.....	58	N.E.....	58
E.....	43	E.....	73	E.....	78
S.E.....	227	S.E.....	106	S.E.....	122
S.....	215	S.....	376	S.....	331
S.W.....	74	S.W.....	41	S.W.....	59
W.....	11	W.....	22	W.....	21
N.W.....	153	N.W.....	96	N.W.....	96
Calms.....	121	Calms.....	95	Calms.....	95

Very soon after beginning to attend "sick call" the preponderance of cases of sickness from certain companies excited my curiosity; and a little reflection led to the belief that the position of the various quarters, with reference to the creek, had some connection with the number of cases reported sick from that company. Accordingly, the following tables were prepared.

TABLE I.

SHOWING WHOLE NUMBER OF CASES OF SICKNESS FROM EACH COMPANY IN THE GARRISON FOR NINE MONTHS, AND WHOLE NUMBER OF DAYS OF SICKNESS.

	Cases.	Days.
C Troop, Ninth Cavalry	71	231
I Company, Twenty-fourth Infantry.....	48	168
C Company, Twenty-fourth Infantry.....	44	139
E Company, Twenty-fourth Infantry.....	39	115
K Company, Twenty-fourth Infantry.....	28	82

D Company, Twenty-fourth Infantry, left this post for another station October 8, 1883, and G Troop, Ninth Cavalry, was "in the field" for nearly four months. To make Table I. more complete we have

TABLE I. A.
FOR SEVEN MONTHS.

	Cases.	Days.
C Troop, Ninth Cavalry.....	51	152
I Company, Twenty-fourth Infantry.....	35	124
C Company, Twenty-fourth Infantry.....	32	100
D Company, Twenty-fourth Infantry.....	28	91

TABLE I. B.
FOR FIVE MONTHS.

	Cases.	Days.
C Troop, Ninth Cavalry.....	21	57
C Company, Twenty-fourth Infantry.....	17	44
E Company, Twenty-fourth Infantry.....	12	34
G Troop, Ninth Cavalry.....	12	29
K Company, Twenty-fourth Infantry.....	9	29
I Company, Twenty-fourth Infantry.....	8	22

TABLE II.
AVERAGE DURATION OF CASES.

	Days.
C Troop, Ninth Cavalry.....	3.25
I Company, Twenty-fourth Infantry.....	3.50 (or 3.02)
D Company, Twenty-fourth Infantry.....	3.25
C Company, Twenty-fourth Infantry.....	3.16
E Company, Twenty-fourth Infantry.....	2.94
K Company, Twenty-fourth Infantry.....	2.92
G Troop, Ninth Cavalry.....	2.16

A case of typho-malarial fever which terminated badly after six weeks in the hospital, and which was the only case of continued fever during the period, might, I think, be fairly left out in computing I Company's average sickness.

There are variations in the number of enlisted men in a company. The full strength of a troop of calvary is sixty-six, of a company of infantry fifty. The mean strength of any company varies constantly from enlistments, discharges, sickness, "detached service," etc. In Table III. the percentage of cases of sickness to the mean strength (*i.e.*, men actually on duty) is shown.

TABLE III.
PERCENTAGE OF MEN SICK WITH MALARIA IN NINE MONTHS.

C Troop, Ninth Cavalry.....	138 per cent.
I Company, Twenty-fourth Infantry.....	128 per cent.
C Company, Twenty-fourth Infantry.....	118 per cent.
E Company, Twenty-fourth Infantry.....	106 per cent.
K Company, Twenty-fourth Infantry.....	68 per cent.

TABLE III. A.

PERCENTAGE OF MEN SICK WITH MALARIA IN SEVEN MONTHS.

C Troop, Ninth Cavalry.....	98 per cent.
I Company, Twenty-fourth Infantry.....	94 per cent.
C Company, Twenty-fourth Infantry.....	89 per cent.
D Company, Twenty-fourth Infantry.....	71 per cent.

TABLE III. B.

PERCENTAGE FOR FIVE MONTHS.

C Troop, Ninth Cavalry.....	38 per cent.
I Troop, Ninth Cavalry.....	20 per cent.

TABLE III. C.

PERCENTAGE FOR ONE MONTH (September, 1883. The most sickly).

C Troop, Ninth Cavalry.....	46 per cent.
I Company, Twenty-fourth Infantry	34 per cent.
E Company, Twenty-fourth Infantry.....	30 per cent.
E Company, Twenty-fourth Infantry.....	20 per cent.

Mean strength of the command for the period, 277.

Total number of malarial cases 269, or 97 per cent.

Total number of days' service lost to the government by malarial sickness among the troops, 855.

Average duration of all cases, 3.02 days.

A comparison of the tables and the diagram will show that the number of cases of sickness and days of sickness increase in each company in direct ratio to its proximity to the banks of the creek, with the single exception of I Company, Twenty-fourth Infantry, which holds the third place in Table I., the fourth in Table II., and the third in Table III. Why? Obviously because the barracks of this company lie directly across the course of the north wind, and, in consequence, present a greater surface to the air currents than those buildings whose long axis is parallel with the direction of the prevailing winds (*i.e.*, north and south.) Were the south wind as unwholesome as the north, K Company; Twenty-fourth Infantry, would have the same average of sickness as C Troop, Ninth Cavalry, but not so great as C Company, Twenty-fourth Infantry (since the latter, as has just been explained, presents a greater surface to the prevailing wind). Leaving out of consideration C Company, Twenty-fourth Infantry, we observe the singular fact that there is a regular gradation in the number of cases in each company, per cent. of cases to mean strength, and days of sickness, as we recede from the creek.

If any one still adheres to the theory of malarial disease so ably advocated by Oldham,²² he might say that the north wind being, as has been stated, so much colder than its opposite (see note) might bring malarial disease into the post by chilling the soldiers. To which the obvious reply is that it is inconceivable that a distance of one hundred feet farther north or south would make such a difference in the temperature of the wind as to have any effect upon those cases of sickness alleged to be caused by the wind.

I am aware that some remarkable instances have been recorded of the

[NOTE.—Without being able to collect precise data, it is quite safe to say that the fall of temperature will exceed 20° F. within two hours of the setting in of a "Norther."]

growth of a line of shade-trees, or the removal a few hundred yards of a dwelling or barrack, stopping malarial fevers. But no observations of bodies of men alike in age and condition, eating the same food, drinking the same water, wearing similar raiment, and performing similar duties, have shown, so far as I know, that a difference of residence of less than one hundred feet from the banks of a stream will make a difference in the number and intensity of cases of sickness occurring on the same days. The banks of the creek afford all the supposed factors for the production of malaria, and to my mind the proof is satisfactory that the miasm was produced at the stream and brought into the post by the north wind. This miasm must, as has been pointed out by various observers, soon lose its potency in the air; or, what would have the same effect, may very soon be precipitated and fall to the ground, otherwise at Fort Sill, C Company, Twenty-fourth Infantry, would have the highest instead of the third place in the tables, since their exposure to the noxious wind is greater than that of any of the other companies.

The blacks seem about as liable to malarial poisoning as the whites in this garrison, although it should be stated that, owing to the small number of white men in and about the post, a fair comparison of the relative susceptibility of the Caucasian and negro races could scarcely be made.

The amenability of the blacks to treatment was, however, quite marked, as the average duration (3.02 days) of the malarial attacks and the slight mortality (only one fatal case) among them shows.

In conclusion, then, I think we may say that both sides of the question—*i.e.*, the aerial and the aquatic transportation of malarial germs—have been proved. A controversy upon the subject would repeat the celebrated duel of the two knights over the bimetallic shield.

I think it fair to assert that in places ordinarily non-malarial the drinking water is probably the more frequent cause of *ague*, when it does appear, than the atmosphere, certain conditions, which we cannot always explain, but which are often, as in case of the water-supply of Las Vegas, mentioned above, quite explicable, impregnating the water. But in places like the Campagna of Rome, the Orinoco River in South America, and the jungles of East India, where malaria is so constant and so deadly, the atmosphere is the usual method of its transportation.

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CLINICAL LECTURES.

TUBERCULOUS PERITONITIS.

CLINICAL LECTURE DELIVERED AT THE MASSACHUSETTS GENERAL HOSPITAL, JANUARY,
1895.

BY FREDERICK C. SHATTUCK, M.D.,

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GENTLEMEN,—I am about to show you a patient who has been under observation, off and on, for a long time, a fact which adds much to the value of the case. My knowledge of him covers a period of upward of four years.

F. P. is now twenty-three years of age. He entered the hospital on the 25th of September, 1889. His family history was negative. A year before admission he had mumps, followed by orchitis, and a few months later swelling of the glands of the neck appeared, with suppuration following; he was troubled with bronchitis and hemorrhoids during the summer. Two weeks before admission he took a fresh cold and complained of soreness in the abdomen, more marked on the right side. At this time the abdomen was symmetrically enlarged, measuring thirty-four inches in circumference, and contained free fluid. There was fluid in the right pleural cavity up to the scapular angle. Shortly after he entered the hospital he was transferred from the surgical side to my service in the medical wards.

The right pleural effusion underwent absorption. On the 4th of Janu-

ary, 1890, he was discharged from the hospital with very little fluid in the belly, and no fluid in the chest. November 3, 1890, he returned with signs of a considerable collection of fluid, localized in the right side of the abdomen. He had, meanwhile, been perfectly well, save a slight attack of gripe, and the cervical glands had almost healed.

On the 8th of November, 1890, I tapped his belly in an unusual place. I tapped him exactly at McBurney's point, because we had evidence that the fluid was no longer free in the peritoneum, but was encapsulated in the right side. There is the little scar. I took out three quarts and a half of highly-colored, slightly bloody fluid, which had a specific gravity of 1017. The girth of the abdomen on entrance was thirty-one inches and a half; after tapping it was twenty-nine inches and a half. On the 20th of November he was discharged.

He reported again October 14, 1891. In the *interim* he had had caries of a rib, which healed up. October 4, 1892, he reported again, feeling well.

To-day the patient comes to us because he has recently "taken cold" and has a little cough, but he is feeling comparatively well. He has been working steadily and hard in a provision store in Cambridgeport, doing pretty long hours. Lately he has changed his occupation and is now on the road, getting more fresh air, and is altogether more favorably situated. The cough leads me, of course, to examine his lungs with great care; but I find nothing, and think he has simply a little bronchitis. To-day he feels first rate. Here you see the marks of suppuration. The glandular trouble was bilateral and fairly extensive, but has entirely healed. Here is the scar of the rib caries. He weighs now one hundred and forty-two pounds, as much as he ever weighed in his life. His belly looks perfectly natural. The bowels act perfectly well, there being no trouble with them. The temperature I took at my office, and it was normal. The liver edge I can feel distinctly, descending on full inspiration. The upper border of the liver is not raised, but the organ is evidently somewhat enlarged. The spleen is also enlarged; you will rarely have a better chance to feel a spleen. On deep inspiration the firm edge comes down against the finger. The increased size of these organs is probably hyperplastic. The general condition of the patient is too good to allow us to seriously entertain the idea of amyloid change.

Here is a man who is to-day practically well, and who has been well for four years, although during the year previous to those last four years he had peritoneal, probably pleural, glandular and osseous tuberculosis. Now this case teaches us at least two very important lessons. In the first place, it teaches a lesson as to the natural history and prognosis of peritoneal tuberculosis. But first allow me one word with reference to the diagnosis of tuberculosis. We have not, in this case, what you may call the clinching evidence,—the discovery of the bacillus. It was not found in the pus obtained from the glands, nor was it found in the fluid drawn from the peritoneal cavity. I think it was not looked for in these fluids; there was no

injection of the fluid into guinea-pigs. The bacteriological evidence is lacking. But for all that, I think there is no question as to the correctness of the diagnosis. What else besides tuberculosis could account for the various lesions observed in the case of this man,—suppurating glands, peritonitis, a carious rib, and pleural effusion?

Now look in Flint's "Practice of Medicine," in the edition of 1886, which was published, it is true, after the death of Dr. Flint, but which was edited by Dr. Welch, of Johns Hopkins University, and the present Dr. Flint. In this work it is stated, "The termination of tuberculous peritonitis is always fatal, either from the disease itself or from tuberculosis of the lungs or other organs. The duration is from one or two months to a year or more." I cite Flint's "Practice" as being a thoroughly representative book, a book which in its day was perhaps the best all-round book on the practice of medicine. Dr. Flint was a man of very large experience and a very careful observer. It may be added that this statement stands unchanged in the seventh edition (1894), edited by Dr. F. P. Henry. That statement, we will say, in the year 1886, represented the opinion of the profession in general,—that the prognosis of tuberculous peritonitis was necessarily fatal. We do not hold that view to-day. What has led us to change our opinion? Modern surgery has led us to change it. The first case that I recall is a case of Spencer Wells. He operated on a young woman with a large abdomen, supposing the enlargement to be due to an ovarian cyst. When he opened the belly he found a large collection of fluid, which was not encapsulated, and a peritoneum studded with bodies which, to the naked eye, resembled miliary tubercles. The fluid was drained out, the wound was sutured up, and, to his surprise, the patient got well. She married later and became the mother of a family. Then came other cases. Other operators had similar experiences, and it was not unnatural that the idea should gain ground that the curative agent, you may say, in these cases was the surgical operation, and that tuberculous peritonitis is a surgical rather than a medical disease. That view we cannot hold to-day; we have to recognize clinical facts, the most important of which is that tuberculous peritonitis gets well under simple general treatment without any interference whatever. I could adduce a number of instances in support of this statement. I will cite only one, the case of a man who, some three or four years ago, was taken acutely ill with symptoms which, for a week, left me in doubt as to the diagnosis between typhoid fever and peritonitis. Effusion then came on, showing that I had to deal with the latter condition. Soon the patient had an extension of the inflammation to both pleuræ, first one and then the other, with some effusion in the right and little or none in the left. Gradually the disease subsided, and, after lying in bed perhaps six weeks or two months, the patient went to the country. A few months later he took a position requiring close confinement, but has remained well ever since. The sceptic might say, "That was not a case of tuberculosis." I could not bring him any clinching evi-

dence; I cannot bring the bacillus; I cannot give a history of the guinea-pigs killed by the injection of the fluids. I could not convince a sceptic; but, at the same time, his scepticism would not affect my opinion. I believe this was a case of tuberculosis. I see no other way of explaining the simultaneous inflammation in the peritoneum and pleuræ in the absence of rheumatism or other obvious septic infection. So let us accept one clinical fact,—that tuberculous peritonitis may get well spontaneously under simple medical treatment. Our patient is an illustration of the fact that the disease gets well after tapping. He had it for upward of a year before he was tapped. The fluid had become encapsulated and shut off in one portion of the abdomen; this fluid was then withdrawn and it has never returned. The patient has remained well ever since, and please note, also, that he worked for nearly a year with that fluid in his belly. That is clinical fact number two. Clinical fact number three is that certain cases seem to recover after surgical interference, and probably by means of it. Which cases are these? This is an important practical question. A case comes under observation: how is it to be treated? Is it a case for surgery? Certainly my knowledge is not sufficient to enable me to state to you clearly those cases which are amenable to surgery, and to surgery alone. I do not know, and I do not believe that any one does at present. It is a question for future solution. Perhaps this is as good a statement as I can make,—surgery should be resorted to in those cases of tuberculous peritonitis in which no improvement takes place after a fair trial of other means, and in which the tuberculosis is not so widespread as to render it practically useless to interfere at all.

There has been a good deal of speculation and discussion as to how surgery is curative. It was suggested that it was either by the draining off of the fluid, or by the admission of air to the peritoneal cavity, or by both, that the injurious influence on the bacilli was exerted. As far as drainage goes, this might explain the cases where recovery takes place after tapping, but we see cases recover without interference of any kind. The admission of air to the peritoneal cavity: it cannot be that, because that supposition does not explain the cases that get well spontaneously or the cases that get well after tapping alone. Of course, the peritoneal cavity may get into such a state from chronic inflammation that it loses its absorptive power. I suppose that was the case with our patient: the cavity over here on the right was probably tied up so that no absorption could take place. Whether it would have done harm to leave the fluid there we do not know; but certainly it did no harm to take it out, and the patient approaches more nearly the standard of a normal man without it than with it.

So that the chief result of surgery in this line is to demonstrate the curability of peritoneal tuberculosis. Modern surgery has also shown us that many of the cases of peritoneal inflammation formerly classed as primary or idiopathic are really tuberculous. There seems to be a tendency among some pathologists to be sceptical as to the tuberculous nature of

cases ending in recovery. It is asserted that the nodules in these cases are fibrous. We must recognize the fallibility of the naked eye. I recall a case in my own wards about two years ago. A young man was under treatment for abdominal pain and tenderness, accompanied by fever and distention of the peritoneal cavity with fluid. I believed the symptoms to be due to tuberculous peritonitis, and, after careful consideration, advised laparotomy. When Dr. Beach opened the abdomen the diagnosis seemed to be confirmed, as the peritoneum was everywhere studded with miliary nodules, with some larger masses which looked like the cheesy masses of agglomerated and older materials. Microscopic examination, however, showed the disease to be cancer, and the patient died soon after. To my mind, at least, the evidence is very strong that tuberculous peritonitis gets well, and I think our patients should receive the benefit of this fact in prognosis.

To return to the patient before us. He has been well now for four years, but his tuberculosis may some time start up again. There may be some bacilli bottled up in him which may get into the blood or lymphatic current, and he may go off rapidly; but he has been perfectly well, and it is not necessary that anything else should come.

The second important lesson suggested by this case concerns the natural history and prognosis of tuberculosis in general. Koch's discovery of the bacillus of tuberculosis has given us a criterion for tuberculosis. It has enlarged our conception very much; it has not only enlarged, but it has defined, our conception of tuberculosis; it has shown us how wide-spread tuberculosis is; it has brought together lesions which were formerly separated more or less; it has brought lupus and scrofula into the same category as consumption. People saw that there was some relation between scrofula and tuberculosis, but what that relation was they were not able to say. We recognized the fact that people with scrofulous glands were especially prone to consumption. The great Hebra, who was a physician before he was a dermatologist, used to say that perhaps scrofula and lupus were syphilis in the third generation. Koch's discovery has confirmed and extended Laennec's views as to the unity of tuberculosis.

Now, almost any organ or tissue may be the seat of tuberculosis, and tuberculosis may be general or it may be local. Let us take first the local forms. It seems to me that the gravity of the local form depends practically upon two things: it depends upon the tissue involved, or it depends upon the seat of the lesion. I mean in any given case the gravity depends upon where the tubercle is. There are certain portions of the body and certain tissues which afford a much better breeding-place for the bacilli than others; in certain parts it is more easy for diffusion to take place through the blood- or lymph-current, so that the disease may become generalized. The second thing which determines the gravity is the character of the tissues of the individual, the vulnerability of the individual, or the soil which he furnishes for tuberculous growth. We recognize the very

great difference which exists in different individuals in this respect. We see some people who will acquire pulmonary tuberculosis with the greatest ease, because, as we explain it, they furnish a favorable soil for the growth of the bacillus; we see others who become tuberculous only with the greatest difficulty, or perhaps are unable to become tuberculous. We see the same in animals: some, as the guinea-pig and rabbit, easily become tuberculous; others, as the dog, show great resisting power to the bacillus. We know that about 1.7 of all deaths, at all ages, in what we call civilized countries, are due to one form of tuberculosis,—namely, tuberculosis of the lungs. Now, the lungs form an ideal breeding-place for the bacilli; they are delightfully warm and moist, and full of nice little chambers and nooks, within which the bacilli can nestle, and if one house gets crowded there are plenty more in the neighborhood ready for occupancy. If you were going to contrive a tissue favorable for the breeding of the bacillus of tuberculosis, you could not produce a better one than the lungs; and the lungs, moreover, are easy of access. Patients are spitting around everywhere, the sputum is dried, and we are all breathing in its contained germs continually. The wonder is, not that so many people die of consumption of the lungs, but that so few die; it is a wonder that there are so many of us left, considering the opportunities for infection. We know that tuberculosis of the lungs gets well; we have just as good proof of this as we have of the fact that we are here in this room this morning. I should like to know how many people have had tuberculosis of the lungs and have never known it: I believe plenty of us have had consumption and have never been aware of it,—a diminutive crop or colony, perhaps, which was choked out and disappeared. I can see no escape from that view when we consider how many patients have recovered whom we know have had the disease. We see cases with abundant physical signs of the lesion and with bacilli in the sputum; we see them live on, and we see them well. Then from the pathological side we see on the autopsy-table scarred and puckered pulmonary apices with cheesy nodules, perhaps, in subjects who have had no history of cough or hæmoptysis: we thus have pathological evidence of cure. We have to recognize the fact that many cases get well, and the question naturally arises, How many persons have had pulmonary tuberculosis and have never known it?

We have touched upon pulmonary and peritoneal tuberculosis; now let us for a moment consider meningeal tuberculosis. *A priori* one might say that the membranes of the brain do not afford so favorable a breeding-place for the bacilli as do the lungs, for instance, however it may be with the peritoneum. The danger here lies in the absolute importance of the brain to life and the predilection of the disease for the base of the brain where the centres of respiration and circulation are found. It is stated in the books to-day, and it is the general belief of the profession, that tuberculous meningitis is necessarily fatal; that if you make a diagnosis of tuberculous meningitis and recovery takes place you may be sure that your diagnosis

was wrong. I am not convinced of the truth of this view. Demonstrative proof in such a case is most difficult; but experience as well as analogy make me sceptical, or incredulous, if you prefer it so.

I recall the case of the child of a mother who was consumptive for some time before its birth and who is consumptive to-day, although, so good is her general condition, it would never occur to anybody that she had such a serious disease without a knowledge of her history and a physical examination. Shortly before and after the birth of the child her disease was more active than it has been since. She nursed the baby herself. During its second year this child had every symptom of tuberculous meningitis except convulsions. I held out no hopes of recovery; but the child got well and remains well to-day at the age of six or seven. The meningeal is probably the most dangerous form of tuberculosis, by reason of the narrowness of the cavity within which acute pathological changes may take place consistently with the preservation of life. But I firmly believe that recovery may, and sometimes does, take place. I think it was Koch himself who remarked that a bacillus is not a lion.

In genito-urinary tuberculosis we have the opportunity of demonstrating the existence and, perhaps later, the disappearance of the bacillus. But the time during which this branch of the subject has received adequate study is too brief to allow us to arrive at definite conclusions. We certainly see the disease here pursue a very chronic course.

To return for a moment to the lungs. A consumptive may either get well, or he may die of the disease; or he may live for many years, tuberculous all the time, and finally die of something else. A patient of mine, now nearly seventy years old, has had a cough for upward of twenty-five years, during at least twenty of which he has been under my observation from time to time. He is well nourished and it would never occur to you that he is a sick man if you should see him at rest. A trifling exertion, however, puts him out of breath. I have always considered his case as one of pure fibroid phthisis with emphysema and secondary heart changes. Recently I was led to examine the sputum as a matter of curiosity, and found abundant bacilli in it. As I look back at the case, its history, symptoms, and progress, I am convinced that his pulmonary disease has been tuberculosis from the start. I see no reason why he should not live ten years more, so well does he himself and those about him understand his limitations and management.

We have thus far considered local forms of tuberculosis. Let us turn for a moment to the general miliary form. Is it possible that recovery from this should take place? I well remember the absolute incredulity with which I read a paper by Dr. McCall Anderson, of Glasgow, some ten or fifteen years ago, in which he maintained the curability of general miliary tuberculosis and in which he adduced cases in support of his view. I wisely shook my head and mentally exclaimed "nonsense," or something to that effect. But to-day I am less incredulous. I am, indeed, prepared

to believe that he is right. Proof is difficult or impossible. But I can imagine that an individual may have acquired a local tuberculosis, limited in area, of longer or shorter duration, and that some of the bacilli may have got into the blood- or lymph-current and thus been more or less widely distributed over the system. Also that his power of resistance may have been such as to enable him to dispose of the organisms after a struggle, more or less prolonged and more or less intense. The amount of the disease and the vitality of the subject must count for much. Under certain conditions any tuberculosis may be recovered from.

If the facts warrant this view, and personally I think they do, our hands are strengthened in dealing with our patients. If you can feel that there is hope, however little, so much the better for your patient. It seems to me that the case which I have shown you to-day gives us just ground for encouragement of which you and your patients may fairly have the benefit. Twenty years ago we should have classed his glandular and rib disease as scrofulous and called his pleurisy and peritonitis idiopathic. To-day we do not talk much about idiopathic inflammation of serous membranes, or indeed of any other tissues.

REVIEW OF MEDICINE.

MEDICINE.

IN CHARGE OF JOHN H. MUSSER, M.D.,

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AND

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A Case of Exophthalmic Goitre, with Monocular Symptoms and Unilateral Thyroid Hypertrophy. (*Medical Record*, July 13, 1895.) By Percy Fridenberg, M.D., of New York.

The patient was a female, aged twenty-four years, who, after much worry and excitement from domestic causes, developed an increase of nervous excitability with the addition of palpitation, dyspnoea, and throbbing of the vessels of the neck. On examination decided exophthalmus of the left eye was noticed, together with marked Graefe's symptom and increase in size of the right lobe and the isthmus of the thyroid. In addition to these symptoms the patient presented a fine, fibrillary tremor in the tongue and hands, tumultuous heart's action, carotid pulsation, venous hum, radial pulse of one hundred and twenty per minute, superficial respiration, flushing and

hyperidrosis, and insufficiency of the recti interni muscles of the eye. A search of the literature reveals thirteen cases of Graves's disease presenting unilateral symptoms. The right eye was affected in all cases except three. The general improvement in the condition of the patient under consideration would indicate that the crossed condition will eventually recede with no change in the limitation of the symptoms.

History of an Epidemic of Exanthematic Typhus; Trial of Sero-Therapy; Beneficial Action of Subcutaneous Injections of the Serum of Convalescents from Typhus. (*Gazette des Hôpitaux*, July 4, 1895.) By Dr. E. Legrain.

The epidemic started in the civil prison of Bougie, in the province of Constantine, in November, 1894; on the 20th of November there were ten fully-developed cases. The prison was built in 1803 on the site of a cemetery; and from 1809 to 1816 all the parts to the west of the city were used as burying places for a large number of Kabyles who had died of a pest. There is a question whether typhus could renew its activity after such a long time. The epidemic assumed very serious proportions, the Europeans being the greatest sufferers. Serum was prepared from two convalescents from grave typhus, and three patients were injected with two, four, and six cubic centimetres respectively. The temperature fell in all in proportion to the quantity of serum injected; the injection of two cubic centimetres giving a drop of 1.2° C. A case is reported that had been for two days in a desperate condition: profound stupor, temperature-curve high and without remission; marked pericardial effusion; pulse thready and irregular, 135 per minute; toxic hemiplegia; respirations 52 per minute. No relief was produced by cold baths or by painting with guaiacol. An injection of ten cubic centimetres of serum was given, and in five hours the temperature had fallen 2° C.; pulse 100, full, and nearly regular; the pericardial effusion had diminished in considerable degree; the urine became abundant, and the respiration became more calm, almost normal. This benefit was not lasting, and in forty hours a second injection of twelve cubic centimetres produced a permanent amelioration of the symptoms. The fall of temperature was not sudden; in taking the temperature every two hours it was noticed that the drop commenced three hours after the injection, and reached its maximum at the fifteenth hour. The cardiac phenomena are probably toxic and not organic affections of the myocardium or of the valves. In a certain number of cases the pulse was improved in a very short time after the injection; from thready it became full and more regular. Generally the slowing of the pulse kept pace with the fall of the temperature. In several cases the coma disappeared in eight or ten hours after the injection of the serum. A case of left-sided hemiplegia, evidently of toxic origin, disappeared in eight hours after the injection. As a rule, the injections have very sensibly relieved the state of patients suffering from grave typhus, when the injection is made in the

first days of the disease. The use of the injections should be reserved for these severe cases.

Actinomycosis cured by Internal Medication with Potassium Iodide, and without Surgical Interference. (*Mercredi Médical*, June 19, 1895.) By A. Poncet.

An interesting history of a case of actinomycosis of the cheek and temporo-maxillary region is related by Poncet. The patient refusing all surgical interference, a complete cure was effected by internal medication with potassium iodide in doses of four grammes per day, continued for over six months. The method of contracting the disease seems to point strongly to the habit which the man had, in his walks in the country, of holding small pieces of hay, straw, etc., in his mouth.

Tests of the Hæmoglobin of Pregnant Women. (*New York Medical Journal*, June 22, 1895.) By Ethel Blackwell, M.D., of New York.

In endeavoring to answer the question, Are pregnant women anæmic? the author estimated the hæmoglobin present in one hundred and sixty-three pregnant women. The examinations were made uniform as to the locality from which the blood was taken and as to the time of making the examination. The majority of these women had an average of between forty and fifty per cent. of hæmoglobin, the general average being 54.2. These results were compared with those obtained from the examination of the blood of forty women students at Bryn Mawr College, one-half of whom had between eighty and ninety per cent. of hæmoglobin; this was distinctly an anæmic condition. When, however, it was remembered that the pregnant women examined belonged to the servant class of New York, the question arose, was this an anæmic condition when compared with non-pregnant women of the same class? An estimation of the hæmoglobin in one hundred non-pregnant women of the same class was made, and a general average of 53.1 per cent. was found. Twenty-three women were tested in the eighth and ninth months of pregnancy and again within twelve days after delivery. The general average of the præpartum cases was 60.5 per cent. and of the postpartum cases 53.2 per cent. Twenty-eight tests were made under six days after delivery, with an average of 53.2 per cent. Twenty-seven cases were examined from six to twelve days after delivery, with an average of 56.8 per cent. At the time of estimating twenty-one postpartum cases the babies' hæmoglobin was also estimated. In sixteen of these the babies' blood showed an average of 96.3 per cent., and the mothers' showed 49.6 per cent., while six of these babies had over one hundred per cent. of hæmoglobin. In a case of twins, the babies had 80.7 per cent. and 81 per cent. respectively, while the mother had 44.7 per cent. In another case the larger child was born first and the cord was immediately tied; he had sixty per cent., the smaller child had eighty-four per cent., while the mother had thirty-nine per cent. at the same time. In

the case of a baby born suddenly of a blind mother, the cord was torn, allowing hemorrhage; the hæmoglobin was forty-five per cent. in the baby and 34.5 per cent. in the mother. Some estimations were made to determine the daily variations of hæmoglobin in the blood of pregnant women. The results gave variations of from three-tenths to seventeen per cent. The results of this investigation may be thus summarized:

1. Compared with non-pregnant women of the same class, the hæmoglobin of the pregnant woman is higher in proportion; 53.1 per cent. in the former, 54.2 per cent. in the latter.

2. The percentage of hæmoglobin falls immediately after delivery.

3. There is a higher general average in the later days after delivery. The exhaustion and loss of blood during the first few days after labor will probably explain this.

4. There is a higher per cent. of hæmoglobin in the blood of the child than in that of the mother.

On the Clinical Value of Ehrlich's "Diazo"-Reaction. (*Medical Times and Hospital Gazette*, July 20, 1895.) By William J. M. Ettles, M.B.

After an examination of two hundred and forty-three specimens of urine, the author concludes that it is found in the urine of a certain number of apparently healthy individuals, two out of eighty-five cases. It is found invariably in typhoid fever and pneumonia. It is found very frequently in pleurisy, twelve out of thirteen cases; in measles, eight out of sixteen cases; and in intestinal obstruction, one out of two cases. It is found frequently in peritonitis, two out of five cases; in suppurative inflammation, four out of sixteen cases; in erysipelas, three out of seven cases; and in phthisis, five out of twenty-one cases. It is occasionally found in rachitis, three out of fourteen cases, and in diabetes mellitus, two out of seventeen cases. It seems to be absent in malignant and chronic, non-tuberculous, visceral lesions. When taken in connection with other symptoms it has a diagnostic importance. Its presence would turn the balance of opinion in favor of a case being measles instead of röteln. Where we are suspicious of typhoid fever its presence would still further incline us to that view, and it would help differentiate tuberculous phthisis from other chronic, pulmonary diseases. These results agree with Nissen's deductions.

Goitre in Michigan. (*Medical News*, July 20, 1895.) By George Dock, M.D., of Ann Arbor, Michigan.

Goitre occurs in all parts of Michigan; it is most frequent in the northern part of both peninsulas, and in the southern part of the lower peninsula. It develops most frequently at about puberty; it affects females in larger proportion than males. In most cases the goitres are small; there is comparative symmetry in the growths, and the grotesque shapes, so

common in Switzerland, are rarely seen. No histological examinations have been made; but the tumors have all the physical characteristics of various forms of beginning struma. Exophthalmic goitre is unusually prevalent in Michigan; but with no evident relation to simple goitre. Goitre affects the lower animals almost always where it is common in man. Horses seem most frequently affected, then dogs, calves, and lambs. In accordance with current knowledge, the pathogenic substance causing goitre is supposed to be a micro-organism or a toxin; but nothing definite is known in this connection. In the cases occurring in Michigan, a very large proportion so afflicted have used well water. No case of simple goitre has been seen in which there was a murmur, even in rapidly-growing tumors. In case of Graves's disease, from which exophthalmus is absent, this sign can be used with advantage. The cases treated with dried thyroid are too few for the drawing of conclusions, but in young persons the remedy seems useful and should be further tried. In addition to improvement in the surroundings of the patient, the sterilizing of the drinking water and the removal of the patient to a non-goitrous district should be tried. The case of a man, aged sixty-six, is reported. This patient had a goitre which had grown in six weeks, and which had involved both lobes and the isthmus of the thyroid gland. After gramme doses of thyroid powder three times a day, continued for two days, the remedy was of necessity suspended, and in a week the goitre had disappeared together with its troublesome symptoms, leaving the neck measuring only one-half inch more than normal in circumference.

A Study of Obstinate Hiccough. (*Dublin Journal of Medical Science*, January, 1895.) By W. Langford Symes, L.R.C.S.I., L.R.C.P.I.

An old gentleman, aged eighty-seven, of a gouty disposition, became afflicted with obstinate hiccough during convalescence from an attack of congestion of the lungs. All remedies were tried with no avail, and the attack finally stopped suddenly after having persisted ten days and nine nights. During this time it is estimated that two hundred and fifty-seven thousand five hundred and twenty spasms occurred. Hiccough is a reflex spasm of the diaphragm, with subsequent closure of the glottis. It may be due to inflammatory diseases of the viscera; to irritation of these viscera; to specific causes, as malaria and gout; or it may be purely neurotic in origin. The pathology is believed to be a reflex spasm of the diaphragm with simultaneous closure of the glottis; having as the afferent nerve the pneumogastric and as efferent nerves the phrenic and recurrent laryngeal. It does not seem clear, however, that the phrenic nerve does transmit the efferent impulse. From clinical observations the sympathetic connections of the semilunar ganglion seem more likely to convey the impressions, for the following reasons: The diaphragm appears to contract before the laryngeal muscles, pointing to a closer and more direct communication with the gastric portion of the vagus than even the recurrent laryngeal.

The course of the phrenic nerve is healthy, and its respiratory function is perfect.

The patient has no control over the spasm, while the phrenic nerve is always subservient to one's will.

Remedies applied to the origin or course of the phrenic or to the cervical spine, such as blisters, ice-bags, compression, etc., have no effect; while those directed to the diaphragm, stomach, and solar plexus are generally curative.

The connection between the pneumogastric and phrenic nerves by means of the third, fourth, and fifth cervical nerves is remote, and if this were the route taken the impression must travel more than twice as fast on the phrenic as it does on the recurrent laryngeal nerve, since it reaches the diaphragm before it does the larynx,—conditions which are unphysiological.

The experiences of Romberg and of Bright show that direct irritation of the phrenic will not produce hiccough.

The existence of a perfect reflex loop between the stomach and diaphragm answers the purpose, is separate from the function of respiration, and is beyond the control of the patient.

The spasm is influenced by the acts of deglutition or vomiting to a greater degree than by any respiratory efforts.

The prognosis is questionable. Much depends on the cause of the spasm and much on the age and the condition of the patient. The treatment may be divided into the empirical, the antispasmodic, and the physiological.

THERAPEUTICS.

IN CHARGE OF ALEXANDER D. BLACKADER, B.A., M.D.,
Professor of Therapeutics, McGill University, Montreal, Canada,

ASSISTED BY

D. J. EVANS, M.D.

The Use of Chlorine in the Treatment of Typhoid Fever. (*American Journal of the Medical Sciences*, September, 1895.) By Reynold W. Wilcox, M.D., LL.D., of New York City.

Wilcox has found the aqua chlori of the *United States Pharmacopœia* an efficient means of administering chlorine, but its solution must be freshly prepared. Chlorine-water should contain at least four-tenths of one per cent. of the gas, and, well diluted, can be administered in doses of from one to four fluidrachms every two, three, or four hours. As soon as the fæces lose their offensive odor, and the odor of chlorine is perceived in them, the dose-limit has been reached, and this amount continued will be sufficient.

The writer has reserved chlorine for cases which have come under observation after ulceration has been established and systemic infection has become marked. In cases seen early, where the manifestations are pre-

sumably local, the insoluble intestinal antiseptics, as naphthalin, salol, bismuth salicylate, beta-naphthol bismuth, and tribromophenol bismuth, are indicated. In the four cases cited, which are considered as being average ones, and illustrate very well the effect of the administration of chlorine, chlorine was employed after other methods, as cold bathing, calomel, hydrochloric acid, had failed. In the treatment of typhoid fever,—

1. Chlorine can be safely administered until complete disinfection of the alimentary canal is obtained.

2. Under its use the tongue becomes cleaner, the appetite and digestion better, fever lower, and the stools devoid of odor.

3. The general strength, the intellectual processes, and nervous conditions improve.

4. The disease is shortened in duration, and usually proceeds to rapid and complete recovery.

On some New Medicines in the Therapeutics of Tuberculosis of the Lungs. (*Therapeutische Wochenschrift*, August 25, 1895.) By Professor E. de Renzi, M.D., of Naples.

The author reports on the effect of some new medicines used in the treatment of tuberculosis as well as of some older medicines the doses of which have been modified.

He first speaks of acidum phenosuccinicum, phenosuccin, and iodo-phenosuccin. The trials on animals and patients showed that these three preparations do not influence considerably the tuberculous process. There was also no constant action on the fever.

Nuclein was given in parenchymatous injections, beginning with one-half cubic centimetre and one-fourth cubic centimetre daily, up to large doses of three and one-fourth cubic centimetres. These injections caused neither local nor general troubles. In most cases they were well borne. Of five patients treated, three showed marked general improvement, one showed considerable decrease of râles, but no great improvement.

Creosotal, creosotum carbonatum, was given three patients in doses of one-half to thirty grammes per day for nine, twelve, and thirty-four days. In all cases it was well received. There was an improvement in all, one even with increase in weight. The fever was not influenced by this medicine; the average temperature was even some tenths higher during treatment.

Hæmoglobin nardi was given to six tuberculous patients in doses of one to ten grains per day for three to seventeen days. Also with this medicine no remarkable effect was obtained, the general condition improved, however, in some, especially when they had taken large doses.

Aqua oxygenata had no effect: the average temperature remained the same.

Liquor arsenicalis was tried in large doses on four patients, increasing from four to fifty drops per day for nine to seventeen days. No trouble was observed from the large doses; the weight increased in all cases. There

was, however, no further general improvement. In one case there was noted decrease in the râles.

Electrical light of an arc lamp of fifty volts and of an intensity of thirty to fifty milliamperes was thrown by a forty-centimetre reflector direct on the thorax of the four patients. In order to neutralize the effect of the heat an electrical ventilator was used. The patients in general stood the ordeal well. In all there were noticed decrease of temperature and of the number of bacilli, although the general condition and the lungs did not show much change. The exposition lasted from thirteen to fifty minutes. It results from these trials, which were somewhat difficult, that if one should succeed in using a very intense light, without calorific rays, considerable curative effects might be obtained.

The thermophor consists in a very long silver wire, which is coiled up between two woollen pieces so that the whole can be applied to the thorax. When the current is turned on the temperature increases considerably. This thermophor was used on six patients, who stood it well, even with high temperature. This was between 60° and 90° C. under the influence of the thermophor on the thorax. Three of the patients improved visibly. One who was treated thirty-four days increased three kilos in weight, and the râles decreased.

The Antisudorific Properties of Picrotoxin. (*Lancet*, September 14, 1895.) By M. Semmola, M.D., of Naples.

The author believes with Goltz, Kendall, and others that there are special sudoriparous nerves independent of the vasomotor system, while the presence of sudorific centres has been demonstrated experimentally in the cat by Vulpian, Luchsinger, Nawrocki, Ostruomon, Marmé, and Adamkewiez. Before an antisudorific treatment be instituted it is necessary to form a clear conception of the pathogeny of the disturbance in the secretion, and, according to whether the nervous sudoral system, the vasomotor system, or the smooth fibres of the blood-vessels, etc., enter into play, one must choose that pharmaceutical substance which, when absorbed, can best modify and counteract the disturbances which, in that especial patient, have caused the diaphoresis. When treating an ephidrosis due to excitement of the sudoriparous nervous system, we must have recourse to the medicines, like agaricine, atropine, etc., which have an inhibitory effect, thus compensating the increase of function; on the contrary, when we believe the ephidrosis is caused by paralysis of the vasomotor centre, we should administer exciting remedies, such as picrotoxin; and, lastly, if there be a diminution of vascular tone from peripheral disturbances, we then use hydropathy, which has such a marked action on the parietes of the blood-vessels.

To a patient with insufficiency of the mitral valves and great prostration following influenza and ephidrosis and cutaneous patches, picrotoxin was administered. Scarcely three days after the remedy had been given

(in doses of half a milligramme twice a day) the sweats gradually diminished, and entirely disappeared on the eighth day of treatment, while hitherto they had been obstinate against all other remedies.

Semmola considers that he was dealing in this case with a perspiration due to paresis, more especially caused by some of the many toxins which are often superadded to influenza, and which exerted their action on the sudoriparous centre and the vasomotor centre of the bulb. The livid red marks on the skin were certainly due to vasomotor paresis, and so confirmed the diagnosis.

SURGERY.

IN CHARGE OF HENRY R. WHARTON, M.D.,

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AND

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Successful Removal of a Large Tumor from the Spinal Canal.
(*Beiträge zum Centralblatt für Chirurgie*, No. 27, 1895.) By Dr. Kümmell,
of Hamburg.

The author relates an interesting case in which a tumor was diagnosed and removed from the spinal canal of a patient, aged forty-seven, with almost entire recovery and relief from pain. The patient had complained, in 1889, of weakness and pain in the limbs which kept gradually increasing, and which resisted all treatment. In May, 1893, a tumor was discovered on the inner surface of the rectum and successfully removed, the patient recovering entirely. This tumor was found to be a sarcoma. The following year the patient again had gradually increasing pain and weakness in the lower extremities, with localized pain beneath the shoulder-blades, followed by a paralysis. On the 6th of November of that year the patient was unable to move at all. The area of anæsthesia extended to the third thoracic vertebra on the left side and to the seventh on the right, with an area of hyperæsthesia extending above. The situation of these areas and the history of their development, together with the history of previous malignant growth, made the diagnosis of a tumor in the spinal canal at about the third thoracic vertebra on the left side nearly certain, although there were no external evidences of its presence. The patient's condition made operation necessary, and an incision over the third, fourth, and fifth vertebræ disclosed an external roughening as an evidence of the presence of disease. The removal of the spinous processes and arches disclosed a crumbling, bleeding tumor within the canal, but not a part of the spinal cord, although the latter was compressed to a marked extent, in sharp

contrast to the normal size above and below the tumor. The compressed portion was dark red and markedly cyanotic. The tumor had no connection with the dura, from which it was easily separated, although a portion of the vertebræ had undergone pressure necrosis. The operation of removal of the tumor and cleansing of the wound occupied a little over half an hour. It is of interest to note the change that took place in the compressed portion of the cord during the short time it was under observation; it rapidly regained its normal size, lost the bluish rose-color, and differed only from the normal part of the cord above and below by the inflammatory color remaining in it. The patient sustained the operation well; the pain in the wound was very slight, and the day following the operation reflex convulsions manifested themselves in the lower extremities. There was, however, no marked decrease in the paralytic symptoms for the next fourteen days, although there was a gradual increase in the severity of the convulsions. The great toes of the right and then the left foot were moved on the sixteenth day after the operation, and the other toes on the succeeding days. A week then elapsed, when the patient moved first the right and then the left foot; other groups of muscles gradually regained their power, until, a month and a half after operation, the patient could raise his legs up from the bed. Sensibility improved gradually with the return of motion, and two months after operation the patient could stand, and later acquired the use of his limbs, so that he could walk for a length of time and climb up and down stairs with the aid of a cane. The only remaining effects of the paralysis are incontinence of urine and difficulty in defecation. The tumor was found to be a sarcoma about the size of an apple. The prognosis for the future of the patient is, therefore, unfavorable so far as return of the disease in some other situation is concerned; but the relief of the symptoms and paralysis make the operation justifiable and of great value to the patient.

Penetrating Wounds of the Abdomen. (*Boston Medical and Surgical Journal*, July 25, 1895.) By James G. Mumford.

A study of thirty-eight cases treated in the Massachusetts General Hospital during the past twenty-four years forms the basis of this paper. Nineteen of these were stab-wound and the same number were gunshot-wound cases. All of the first class were operated upon, of which three unusually serious cases died,—the first of hemorrhage from opening of the external iliac artery, the second from laceration of the spleen, and the third from wounding of the omentum and stomach, causing hemorrhage and extravasation of stomach contents. The remaining sixteen cases recovered. In fifteen there was no penetration of the alimentary track; in one perforation of the intestine took place, but, although there was extravasation of feces, the general peritoneal cavity remained unpolluted.

Of the gunshot victims, twelve of the nineteen died. Seven were operated on, and in every case the viscera were perforated, the deaths being

due to extravasation from the stomach and intestines, to injury of the kidneys, or to a wounded aorta. As with the stab-wounds, in every case in which there was extravasation into the general peritoneal cavity the patient died. Of the seven cases that recovered, five had no perforation and two perforation of the stomach only. The relatively lower death-rate after wounds of the stomach, as compared with those of the small intestine, may be accounted for by the anatomy of the parts. Both the stomach and the large intestine contain more muscle than the small intestine, and the various coats are not so closely associated. The mucous membrane is much more loosely attached and acts like a valve when a small hole is punctured, preventing extravasation. The colon is in part extraperitoneal, and the contents being less liquid than in the small intestine do not easily escape when the bowel is punctured.

The study of a very large number of cases convinces the author that nearly all extravasations are fatal. Stomach wounds with extravasation are fatal; without, they are generally recovered from. The same is true of the small intestine; but extravasation follows most small intestine wounds, while it does not follow most stomach wounds. A low death-rate from hemorrhage is due to early checking by operations. From wounds of the kidney the mortality has been high of recent years. Most of the fatal cases were brought in in a state of collapse and died in a few hours. The collapse in the majority of cases was not caused by hemorrhage but by extravasation.

To sum up this paper in brief,—

Gunshot-wounds show a much higher mortality than stab-wounds, but those stab-wounds which penetrate the viscera show a mortality equally high.

Wounds of the small intestine are usually fatal. Wounds of the stomach may be survived.

Explore all doubtful cases. This is the course of least danger.

Barring hemorrhage, early death after the accident is not from shock but sepsis; because,

Finally, this is seen only when the fatal extravasation takes place.

Intestinal Invagination and its Treatment. (*Beiträge zum Centralblatt für Chirurgie*, No. 27, 1895.) By Dr. Rydygier, of Krakau.

This author has gathered together a series of eighty-four new cases of operation for this condition from reliable sources; and from his study of them and cases occurring in his own practice draws the following conclusions:

In acute intestinal invagination,—

1. Operation should be employed as soon as non-operative measures have been thoroughly tried without success.

2. After the laparotomy disinvagination should be attempted before all other methods. If there are any suspicious-looking points on the intestinal

wall where rupture may be feared, the peritoneum should be walled off with iodoform gauze, or the part should be drawn out of the abdominal cavity.

3. When disinvagination is impossible, resection of the invagination should be employed, through an incision in the wall of the invaginator.

4. The resection of the entire invagination is to be employed where there are marked alterations in the wall of the intestine and perforation threatens.

5. The formation of an artificial anus and entero-anastomosis have usually no place in acute intestinal invagination. Only in case of collapse is an *anus præternaturalis* made admissible.

In chronic intestinal invagination,—

1. Non-operative therapeutic measures should be employed, but not for more than one week.

2. During the period between the attacks, operation is to be advised.

3. After laparotomy disinvagination is to be attempted tentatively. Four successful cases have been reported,—one at the end of nine months, two after six months, and one after ten weeks.

If this does not succeed, resection of the invagination should be employed. Entero-anastomosis may be employed where there are adhesions; but there are no indications in chronic intestinal invagination for the formation of an artificial anus.

NEUROLOGY.

IN CHARGE OF LANDON CARTER GRAY, M.D.,
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AND

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Causes Conspiring to Produce Mental Enfeeblement in Children; Causes of Imbecility; Varieties of Idiocy; Pathology of Idiocy. (*American Medico-Surgical Bulletin*, August 1, 1895.) By F. Savary Pearce, M.D., of Philadelphia.

1. Causes of mental backwardness. These causes may be divided into those operating before and those operating after birth. Among the causes operating before birth may be mentioned inebriety, syphilis, and phthisis, shock and nervousness. The percentages are necessarily inaccurate because parents and relatives keep back information as to the first three and give prominence to the last two. Phthisis is a very frequent predisposing cause. Among the postnatal complications may be mentioned accident, abuse and neglect, disease, sunstroke, and instrumental delivery. Of these, fever should receive more attention, since prolonged high temperature must have a deleterious influence on the developing brain. 2. Varieties of imbecility

or idiocy. As one classification we find congenital idiots, children born with impaired mentality; accidental idiots, children in whom trauma, epilepsy, etc., are causes; and developmental idiots, children in whom the mental enfeeblement comes on in an apparently brilliant child at some special epoch of strain in its life history. According to the somewhat vague resemblance of idiots to the different races we have the ethnic types of idiots of Langdon Down: Mongolian, Caucasian, Negroid, Ethiopian, Malay, Kalmuc, and American Indian. There are also the mercurial idiot and the "idiots savans." Ireland's classification is based on the causes conspiring to idiocy or existing with it, on the anatomy, or on certain movements assumed by the idiots. We have, then, the choreic, cretinoid, eclamptic, epileptic, genetous, hydrocephalic, hypertrophic, microcephalic, inflammatory, paralytic, plagiocephalic, scaphocephalic, strumous, taxic, the idiot of deprivation, and the sensorial idiot. 3. Pathology of idiocy. In considering this subject we must remember the rapidity of the development of the brain at different ages, and we must consider whether the pathological cause acts early or late. Anæmia is rare as an uncomplicated pathological entity. Hyperæmia, likewise, is not common as an unity; but, when it does exist, the dura and pia are loaded with blood, as are the sinuses and the choroid plexus. Atrophy of the brain may be local or general, and when partial is congenital or acquired. In this condition the nerve-cells are round instead of stellate and are not branched. In the white matter few nerve-fibres exist as compared with excess of neuroglia or connective-tissue elements. There may be shrinking of the anterior cornua of the cord; but no degeneration in its white columns has been noted. Hypertrophy is rare and is general or partial and is to be told from hydrocephalus. Virchow describes it as an excess of the neuroglia or connective tissue, which breaks down and becomes the granular-looking *débris* described by Rokitansky. Softening often occurs, either locally or generally, and is due to less blood being carried to the brain. Meningitis, tumors, and thrombi of the middle cerebral arteries or of the superior longitudinal sinus may be potent causes of softening. Microscopically, remnants of nerve-fibres, granular cells, *débris*, and blood-corpuscles are seen throughout the field. Sclerosis may be diffused in spots no larger than a pin's head or in patches. Here, again, the medullary substance is increased as compared with the gray matter. Hydrocephalus is seen in not a few idiots, and it is in these cases that the extremities are frequently paralyzed from excessive cerebral pressure. Porencephalus is either the result of diffuse hemorrhage *in utero* or is due to trauma later in life. Tumors may occur and are either tuberculous or gliomatous. Asymmetry of the head and of the convolutions is sometimes found. Alteration of the proportion of white to gray matter in the brain, when existent, consists of a great increase of the white substance. Simplicity of the convolutions in size and arrangement is often seen and is an evidence of reversion to our arboreal ancestry. Chronic meningitis is a frequent pathological condition. Acute meningitis is often

the immediate precursor or the cause of death, and is either simple or tuberculous. The most frequent lesions of the cerebellum are atrophy, tuberculous tumors, and cysts. Degenerative changes are found in the cord where cerebral palsies coexist with imbecility. As deformities we most frequently find high palatal arches, badly set teeth, and club-foot. The latter is more common in males. Histologically, the nerve-cells are round, not pyramidal, the nucleus is round or oval, and is in the centre with retracted protoplasm around it, thus leaving a clear space or a faintly-stained granular substance. Only occasionally are the nuclei at the base of a cell; at times the nucleus is at the apex of the nerve-cell. The nerve-cells have few processes and these are small and stunted. The apical process is nearly always present. Now and then processes exist but no spaces can be found. Where sections are hardened there is often noted a curious honey-comb condition, due to the number of cells with spaces seen in the field. In frozen sections no clear spaces are to be seen. The nucleus stains deeply, the protoplasm less so. The apical process of the nerve-cell is always seen and the cells are less stunted than in hardened sections. In either method of examining the cortex not more than five layers are detected, and the third layer is most affected.

The Knee-Jerk in Locomotor Ataxia, complicated by Hemiplegia.
—M. Raichline reported at the Society of Biology, Paris, June 29, 1895, a case observed with M. Landrieux, in which secondary contracture and restoration of the tendon reflexes occurred after an organic hemiplegia, in a person afflicted with tabes. This is an unusual event, as usually a hemiplegia remains placid and the reflexes do not return if the person afflicted is already tabetic. He considered the loss of the knee-jerk in tabes as not due to a destruction of the reflex arc, but that the disease exerts an inhibitory influence on the reflex activity of the cord, and that due to the secondary degeneration of the crossed pyramidal tract, this reflex activity is exaggerated, and the knee-jerk is restored in some cases.

A Case of Tabes, with Involvement of One Spinal Root, in General Paralysis. (*Revue neurologique*, numbers 12, 13, and 14, June and July, 1895.) By Dr. Nageotte, chief of the Laboratory of Professor Raymond at the Salpêtrière, Paris.

In the sacral portion of a cord in a case of general paralysis Dr. Nageotte has found the interstitial neuritis of the roots, which we have described in a previous number of the *INTERNATIONAL MEDICAL MAGAZINE*. The nerve substance proper was not involved at this level of the cord, as the lesion had not existed sufficiently long. There was a uniform meningitis everywhere. A slight degeneration was noticed in the pyramidal tracts, which increased from above downward, and began at the medulla oblongata.

At the level of the lower fibres of the second and the upper fibres of the third dorsal roots a slight sclerosis was found against each posterior horn in the column of Burdach, touching the gelatinous substance of Rolando, and passing towards the point of entrance of the roots. In the same region there was a diminution of the fibres in the zone of Lissauer and in the posterior horns. These bands of sclerosis in higher sections passed inward towards the internal part of the columns of Burdach in the form of crescents. Below the third dorsal there was a degeneration of the descending branches of the nerves affected, which diminished in extent, and became separated from the posterior horns at lower levels. There are only three cases of lesion of isolated roots of the upper part of the cord recorded (Pfeifer, Gombault, Sottas) and in none is a descending degeneration described.

Dr. Nageotte has found the lesion discovered by him in the cords of six patients who had died from general paralysis, and he believes that the pure form of tabes and the form seen in general paralysis are the same. He asserts that the theory which places the primary lesion in the spinal ganglions lacks anatomical foundation, and that the theory of toxins which act on the posterior cord is incapable of proof.

Obersteiner and Redlich speak of a meningitis and an arterial sclerosis as the cause of tabes. In the case described by Dr. Nageotte only a few intramedullary fibres were diseased, and at this point the meningitis was not greater than elsewhere; the spinal roots showed no change. Obersteiner and Redlich have claimed that the posterior roots are not affected in beginning tabes, and have explained this by putting the seat of primary lesion at the point of entrance of the roots into the cord. When the roots are later affected it is due to retrograde degeneration. No one has described a retrograde intramedullary degeneration of the posterior root fibres; are we to consider that the extramedullary portion is more sensitive? Retrograde degeneration of the pyramidal tract is known, but one cannot compare the different columns of the cord too closely. Obersteiner admits that the meningitis is not always found in tabes. In many cases of spinal syphilis the meningitis is of a high grade, and yet there is no tabes. Careful study of the arrangement of the pia fibres at the point of entrance of the posterior roots shows that strangulation is impossible. Nor does any vessel enter the cord at this point. In a longitudinal cut the slightest obliquity can increase the appearance of the ring-like contraction of the pia at the point of entrance. The cord is elastic, after removal from the vertebral column, and after three days of hardening it shortens one-tenth of its previous length. The roots are also contractile. All this produces the appearance of stricture around the entering roots, but this was not present in a cord hardened by Dr. Nageotte without removal from the vertebral column. The author claims that the root neuritis, described by him, compresses and interferes with the nutrition of the root; that this latter commences to degenerate in the cord at the part farthest from the trophic

centres, while the root itself may appear normal. In general paralysis the degeneration is also greatest in that portion of the pyramidal tract which is farthest from the cerebral cortex.

OPHTHALMOLOGY.

IN CHARGE OF CHARLES A. OLIVER, A.M., M.D.,

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AND

EDMUND LANDOLT, M.D.,

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A Case of Paralysis of the Superior Recti Muscles. (*Columbus Medical Journal*, May 28, 1895.)

A most interesting and instructive instance of this exceedingly rare type of ocular disturbance has been seen by William E. Bruner, of Cleveland, Ohio. The peculiarities of the case consist in the facts that there was intermittency in the relative strengths of the two paretic muscles; that there was nothing to indicate spasm of the inferior oblique, and that there were two degrees of esophoria.

The author, inclining to the thought that the paralysis in his case was congenital in origin, tends to the belief that the condition was due to a central deficiency rather than to malformation or arrest of development of the muscles.

Diphtheritic Conjunctivitis; its Treatment with Antitoxin Serum. (*Annales d'Oculistique* (English edition), April, 1895.)

Without being able to assert positively that spontaneous recovery could not have occurred in four most interesting and typical cases of diphtheritic conjunctivitis which were successfully treated by injections of antitoxin serum, V. Morax, of Paris, believes that the amelioration of the local changes and the betterment of the general condition so quickly followed the use of the material that its therapeutic usefulness must be assumed.

In doubtful cases where there is a pseudo-membrane with purulent discharge, he supplements the serum injection by the employment of a collyrium of nitrate of silver. Where the case, though certain by bacteriological study to be diphtheritic in nature, does not present any such secretion, the serum injection alone, he thinks, is sufficient to produce resolution and recovery.

Gallicin, a Gallic Acid Derivative; its Use in the Treatment of Eye-Diseases. (*Annals of Ophthalmology and Otology*, July, 1895.)

The results obtained by the use of this preparation of gallic acid, which was first employed in some two hundred ophthalmic cases by Mellinger, of

Basel, have been confirmed by George F. Suker, of Toledo, Ohio, in an additional series of thirty cases. He sums up the therapeutic value of the drug as follows :

It is applicable in all cases of catarrhal affections of the mucous membrane of the eye, either with or without secondary eczema, in cases of phlyctenular keratitis or conjunctivitis, and is exceedingly serviceable in follicular conditions and in superficial keratitis.

He believes that it is indeed worthy of trial, and in the future will, no doubt, play an important rôle in the treatment of the above-named diseases. He thinks that it is best employed in the powdered form ; and, being very light, he has found that about one centigramme is sufficient for an application. He says it is to be applied once or twice daily as may be deemed expedient.

Alveolar Fibro-Sarcoma of the Optic Nerve. (*Archives of Ophthalmology*, April, 1895.)

Finlay, of Havana, Cuba, has had the good fortune to study the histological appearances of such a growth which occurred in the practice of Lopez, of the same city. As he says, it was curious to note the difference in structure presented by the tumor at different points. He found that it was instructive to follow the transition from the more highly-organized alveolar sarcomatous condition to the more atypical ordinary variety, and into the still more lowly-organized myxosarcoma.

From a careful analysis of the statistics of the results of operative procedure in such cases, he believes that operative interference is called for as soon as the diagnosis is made, as the tumor, if left to itself, will almost necessarily produce death, and the earlier the operation is performed the greater the chance of success. He thinks that "the comparatively large proportion of deaths immediately after the operation makes a strict adherence to the rules of aseptic and antiseptic surgery a necessity, and that the presence of metastatic growths within the cranium or of a direct intracranial extension seems to predispose to infection of the meninges ; if such an extension can be inferred, all operative interference, with a radical cure in view, is contra-indicated."

He says that, in view of the good statistical returns, an attempt at preserving the eyeball is justifiable, and even recommendable, provided an ophthalmoscopic examination permits one to infer that there is no extension of the growth into the interior of the eye, and that the presence of the eyeball does not interfere with the complete excision of the tumor by limiting the field of operation.

He believes that where there is any suspicion of an extension into the orbit an exenteration should be performed, and says that the results of operations on recurring growths are not encouraging, but thinks that such a procedure may be at times beneficial, provided that there are no grounds to suspect an intracranial extension.

OBSTETRICS AND GYNÆCOLOGY.

IN CHARGE OF RICHARD C. NORRIS, M.D.,

Lecturer on Clinical and Operative Obstetrics in the University of Pennsylvania; Obstetrician-in-Charge, Preston Retreat; Visiting Obstetrician, Philadelphia Hospital; Gynæcologist, Methodist Episcopal Hospital; Consulting Obstetrician and Attending Gynæcologist, South-eastern Dispensary and Hospital for Women and Children.

Some Practical Points in Connection with Rupture of the Female Perineum. (*Provincial Medical Journal*, July 1, 1895.) By William Dunnett Spanton, F.R.C.S.

The writer has operated on women of all ages between sixteen and seventy-three, and has found that age makes very little difference in the result of the operation. He thinks that elderly women should share the benefits which this safe procedure affords. With reference to the legal aspect in a case of laceration of the perineum left to itself, a case is cited where the physician neglected to repair the laceration immediately after its occurrence, in which septicæmia followed. An action was entered against the surgeon for damages, which resulted in the payment of the sum claimed by the patient, under the advice of the medical man's solicitor. He says, "The legal point is perfectly clear, that when in the ordinary course of treating a patient a mishap does occur, the surgeon will not be held liable provided he takes the necessary steps to put it right; but, on the other hand, the neglect to do this, whether from oversight or from a sense that it is unnecessary, renders him liable for any after-trouble, loss of time, and so on, to which the patient may be in consequence subjected."

The mode of operation adopted by the author is as follows: The patient is prepared by clearing the bowels several days before the operation, and an enema is administered a few hours previously, not just before the operation. The patient is kept in bed a day or two before the operation. The time preferred is just following a menstrual period. The surface is shaved and cleansed with carbolic soap and chloroform. The amount of denudation necessary will depend upon the extent of the tear. Usually the line between the labia minora and labia majora is a good guide, and a rounded incision is made across the septum formed by the remains of the perineum, and extending on each side far enough forward to form a broad surface, of which the sides are to be brought into apposition. The flap is dissected up by a so-called splitting process, keeping as nearly as may be equidistant from vagina and rectum. This flap of vaginal mucous membrane and skin is held forward and brought together and held there until the deep sutures have been inserted. A full-curved needle is passed from one side of the raw surface to the other, commencing about one-third of an inch outside the skin margin and emerging on the opposite side at a corresponding point. These silkworm sutures are placed about three-eighths of an inch apart, are drawn up, not too tight, and secured. Catgut sutures are then placed in the anterior vaginal margin and cut off short. If the rectum is involved,

a flap similar to the anterior one is made, commencing at the anterior anal margin. This flap is turned back, and a sharply-curved, thin Hagedorn needle carries a fine catgut suture first through one side and then the opposite, from the raw surface through into the rectum, leaving the ends hanging out. These are inserted about one-sixth inch apart, and are then tied from above downward, each knot being left in the rectum. An additional suture is placed at the point which is to represent the posterior edge of the new perineum, which helps to secure a rounded surface when all heals up.

PATHOLOGY.

IN CHARGE OF ALLEN J. SMITH, A.M., M.D.,

Professor of Pathology in the Medical Department of the University of Texas, Galveston, Texas,

AND

HENRY W. CATTELL, A.M., M.D.,

Demonstrator of Morbid Anatomy in the University of Pennsylvania; Prosector to the American Anthropometric Society; and Pathologist to the Presbyterian Hospital, the Institution for Feeble-Minded Children at Elwyn, etc.

On the Classification of the Amyloid Substance among the Albuminous Bodies. (*Zeitschrift für physiologische Chemie*, p. 343.) By A. Tschennak.

The amyloid material used in the experiments was in the form of a light yellow powder, and was obtained from amyloidically degenerated organs (liver and spleen) through complete mechanical pulverization and extraction by hot water, by alcohol, by ether, and by sieves. The material so prepared dissolved readily in alkalies, less so in organic and mineral acids, and on heating with water it is digested by pepsin and trypsin. There probably results at first unchanged but dissolved amyloid material, then it becomes an albuminate, and after longer action primary and secondary albumose and peptone. All these products gave the color reaction in the same way as the original substance, in part even more clearly. In regard to its elementary composition the amyloid material would therefore seem to belong to the albuminous bodies. In view of its comparatively lessened solubility, especially in acid, and its finer way of appearing in the organism, Tschennak counts the amyloid among the coagulated albuminous materials. The same place is given by the author to the hyaline substance, and he is of the opinion that the amyloid substance is a modified coagulation form of the circulating albumen, probably of the serum albumen, and not of the fibrin. The coagulation might take place in affected organs or in the already coagulated substance, and it might be conducted, perhaps through the leucocytes, from the blood to the organs and there deposited, eventually to be still further changed. Nothing could be established in regard to the cause of the remarkable color-reaction of the amyloid material.—*Centralblatt für medicinische Wissenschaften*, August 24, 1895.

A Quick Method of filtering Blood Serum. (*Johns Hopkins Hospital Bulletin.*) By Gwin Campbell, M.D., and A. D. Ghiselin, M.D.

The design of this filter was taken from an apparatus for filtering liquid through a Chamberlain bougie that appeared in the Army Exhibit at the World's Fair, in Chicago.

The filter proper is a single bougie water-filter strengthened to allow the safe use of high pressure, and arranged so that a flask may be attached without risk of contamination. A drum consisting of a cylinder four feet long by four inches in diameter which contains ten pounds of liquefied carbon dioxide is connected to the filter. In the upper part of the cylinder is a safety-valve and also a valve by which the pressure can be turned on. Attached to the latter is a thick-walled rubber hose which has fixed in it a pressure gauge registering three hundred pounds. A rubber-stoppered flask having two tubes passing through the stopper is used for collecting the filtrate. One tube is short, with an expanded end which is packed with cotton, and to the other long tube is attached a piece of rubber hose about two feet long, divided in the middle, and the two pieces joined by a glass nozzle. On this piece of hose are two of Mohr's pinchcocks. The other end of the hose is slipped over the open end of the bougie. After sterilizing this portion of the apparatus the bougie is introduced into the shell and the lower cap screwed on. The serum is poured in the upper opening of the shell. The drum is now connected to the filter, and when a pressure of about two hundred pounds is observed by the gauge the valve is closed. One thousand cubic centimetres of serum can be filtered in five minutes. It is perfectly clear, coagulates at exactly the same temperature as unfiltered serum, and no appreciable effect can be noted on any toxin or antitoxin that may be present.

FORENSIC MEDICINE.

IN CHARGE OF LORENZO D. BULETTE,
Of the Philadelphia Bar.

A CASE OF IMPERFECT REGISTRATION UNDER THE NEW YORK MEDICAL ACT.

THE circumstances under which ignorance of the law excused the failure of a physician to register according to law find illustration in a recent case in New York.¹ The physician, instead of registering his license with the county clerk, filed it with the board of health; but, after the commencement of a prosecution to recover the penalty imposed for failure to make

¹ Mayor of New York *vs.* Blank, 34 N. Y. S. 92.

proper registration, and before trial, the physician made legal registration, and it was held that such subsequent registration is a defence to an action for the penalty.

The medical act of New York requires, as a condition precedent to the right to practice medicine, that a license be registered with the county clerk; and, for practising without such registration, the person so offending shall forfeit fifty dollars to the county. But the act also provides that if one "whose registration is not legal, because of error, misunderstanding, or unintentional omission, shall submit satisfactory proof that he had all the requirements prescribed by law at the time of his imperfect registration, he may, on unanimous recommendation of a State board of medical examiners, receive from the regents under seal a certificate of the facts, which may be registered by any county clerk, and shall make valid the previous imperfect registration." Having, from ignorance of the law, filed his license with the board of health, instead of with the county clerk, the defendant pursued the practice of medicine; and thereupon this action was brought to recover the prescribed penalty. At the trial the physician produced a certificate by the county clerk that, since the suit, he had made due registration, in conformity with the statute. Upon this state of fact, the prosecutor moved for judgment, but the court decided for the physician and dismissed the prosecutor's complaint.

On appeal, Mr. Justice Pryor, delivering the opinion of the court, said, "Despite the elaborate and interesting argument of plaintiff's counsel, we are of opinion that the action may not be maintained. 'In expounding penal statutes, it is an established rule that the construction must be strict as against the defendant, but liberal in his favor.' And this canon of interpretation was applied by a very great judge to precisely such a statute as that in question,—namely, one imposing a penalty for exercising a trade without due qualification.

"It is contended that, as the penalty was incurred by the defendant's unauthorized practice, his subsequent qualification is ineffectual to its remission. The registration with the board of health, argues the plaintiff's counsel, was not an imperfect registration, but simply no registration. The statute allows an 'illegal' registration to be repaired, where the cause of it was 'some error, misunderstanding, or omission.' The case is within the very terms of the statute. Nor is it less consistent with the policy of the statute, which is to admit a competent physician to practice when, in good faith, he has endeavored to comply with its requirements. If that be so, still the plaintiff insists that the statute is not retroactive, and is inoperative to validate an invalid registration. This is just the effect it contemplates and accomplishes. By its terms the subsequent registration 'shall make valid the previous imperfect registration.' What is thus made valid? Obviously, the previous imperfect registration. If this be not the true construction, then the words are meaningless, because without them the correct registration would take effect at once, and authorize future practice. If so,

urges the plaintiff, a man may register whenever he pleases. Why not, if, seeking to obey the law, he has evaded it by error or inadvertence? The construction we adopt would be repugnant to the policy of the statute if the unauthorized practice of an incompetent physician were condoned by the subsequent registration. But, to obtain such subsequent registration, he must 'submit satisfactory proof that he had all the requirements prescribed by law at the time of the imperfect registration.' Having such requirements, what harm ensues from suffering him to supplement the defective authentication of his competency? The subsequent registration demonstrates his qualification from the beginning. Nor was the remedial operation of the subsequent registration in legalizing prior practice arrested by the institution of this action. As the suit is by the public for the benefit of the public, a repeal of the statute *pendente lite* would cancel the penalty. Where the action is by an individual for his own benefit, such repeal, any time before final judgment, would bar recovery of the penalty. *A fortiori* is the penalty revoked by an act which the statute imposing it provides shall remove the provocation of the penalty. Without a penal clause there cannot be a penal consequence.

"It is conceded that the defendant is a competent physician, in large practice; that his failure to comply with the law in the first instance was not intentional, but inadvertent; that, apprised of his mistake, he promptly corrected it; that at the trial his qualification was certified in legal form. Why, then, should he be chastised by a penalty denounced against imposture only? To give the statute such an effect would be equally against the settled rules of construction, the obvious policy of the law, and the equities of the individual." And the judges all concurred in affirming the judgment in favor of the physician, and mulcted the prosecutor in costs.

BOOK REVIEWS.

SKIASCOPY AND ITS PRACTICAL APPLICATION TO THE STUDY OF REFRACTION. By Edward Jackson, A.M., M.D. Philadelphia: The Edwards & Docker Co., 1895.

This is a modest little book, written, as its author says, to bring about the more general adoption of skiascopy (the shadow-test) as an essential part of the examination for ametropia. The modesty of its appearance should not, however, cause it to be classed with those manuals which are simply compilations of the general knowledge of their subject. Remembering the paucity of the literature on the shadow-test, and how little real knowledge of it is the common property even of ophthalmologists, this work must be accorded a much higher place. It is easy, indeed, to see that its pages are the result of much original thought and painstaking investigation.

Its success in the direction of its author's purpose will depend, in the first place,

upon the usefulness of skiascopy itself; and, secondly, on the clearness with which the book teaches the art of its application. The author asks a strong claim for the method when he says, "It is by far the most accurate objective test. The limits of its accuracy depend on details of its execution, and the skill and patience of the observer; but it does not require any rare natural qualifications to carry it, for many eyes, to the extreme limits of accuracy for subjective tests." If this be admitted, the necessity to the student of ophthalmology of a mastery of the art of using the test is imperative. A purely objective method of measuring the refraction, which is as accurate as the usual subjective method, dealing, as the latter does, in quarter diopeters, is a thing no ophthalmologist can afford to neglect.

The majority of those who have mastered the method will not regard the author's claim for it as too strongly worded. In fact, the usual objections one hears to the shadow-test relate to difficulties in its application. Though these are, haply, many, the accuracy of the result would outweigh them all, even were they more than they are.

Turning then to the technique of the application of the test, we find about three-fourths of the book devoted to this part of the subject. The descriptions of the various manual operations are written in a simple, terse style, while every point of difficulty in the study or use of the test has received careful consideration. The twenty-six illustrations are nearly all original, and are all good. Those showing the appearance of the light in the pupil in the forms of symmetrical aberration and irregular astigmatism will alone give shape to what many a student has, so far, literally, "seen through a glass, darkly."

The book is opportune. The use of the test has passed the experimental stage. The optical principles involved, and the best methods of its practical application, its advantages and its limitations, have been studied and defined. The method can now be presented entire, and recommended with confidence to the student. Every one acquainted with the part Dr. Jackson has taken in its development will recognize him as peculiarly fitted to so present the subject. It is safe to predict that the book will at once take its place as the standard work on the subject,—a subject destined to grow in recognition for many years to come.

R. J. P.

BOOKS RECEIVED.

J. B. LIPPINCOTT CO., PHILADELPHIA.

DUHRING'S CUTANEOUS MEDICINE: A SYSTEMATIC TREATISE ON THE DISEASES OF THE SKIN. By Louis A. Duhring, M.D. Part I., Illustrated. 8vo. Cloth, \$2.50.

LEA BROTHERS & CO., PHILADELPHIA.

BLACK ON THE URINE: THE URINE IN HEALTH AND DISEASE, AND URINARY ANALYSIS, PHYSIOLOGICALLY AND PATHOLOGICALLY CONSIDERED. By D. Campbell Black, M.D., L.R.C.S., Professor of Physiology, Anderson College Medical School. In one 12mo volume of 256 pages, with 73 engravings. Cloth, \$2.75.

DERCUM ON NERVOUS DISEASES: A TEXT-BOOK ON NERVOUS DISEASES. By American Authors. Edited by F. X. Dercum, M.D., Clinical Professor of Diseases of the Nervous System in the Jefferson Medical College, Philadelphia. In one octavo volume of 1052 pages, with 341 engravings and 7 colored plates.

Cloth, \$6.00; leather, \$7.00. List of contributors: N. E. Brill, M.D., Chas. W. Burr, M.D., Joseph Collins, M.D., Charles L. Dana, M.D., F. X. Dercum, M.D., Geo. E. De Schweinitz, M.D., E. D. Fisher, M.D., Landon Carter Gray, M.D., C. A. Herter, M.D., George W. Jacoby, M.D., William W. Keen, M.D., Philip Coombs Knapp, M.D., James Hendrie Lloyd, M.D., Charles K. Mills, M.D., S. Weir Mitchell, M.D., Charles A. Oliver, M.D., William Osler, M.D., Frederick Peterson, M.D., Morton Prince, M.D., Wharton Sinkler, M.D., M. Allen Starr, M.D., James C. Wilson, M.D.

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WILLIAM WOOD & CO., NEW YORK.

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INTERNATIONAL MEDICAL MAGAZINE.

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ORIGINAL COMMUNICATIONS.

A CONTRIBUTION TO THE CLINICAL STUDY OF INTRA- THORACIC TUMORS.¹

FROM THE PEPPER LABORATORY OF CLINICAL MEDICINE.

BY WILLIAM PEPPER, M.D., LL.D., AND ALFRED STENGEL, M.D.,
Of Philadelphia.

ACCURATE knowledge regarding mediastinal and other intrathoracic tumors dates from a very recent period, notwithstanding the fact that a number of the older authorities had recorded observations, and had invited attention to their study. Of the mediastinal growths recorded, the earliest is probably that of Boerhaave, of a steatoma of the anterior mediastinum, reported in 1742. It is probable, however, that a similar observation had been made even earlier than this, in the beginning of the seventeenth century, by Willis. After Boerhaave, Lieutaud described several cases in 1787; Boyle still further increased the number in 1812, and Lobstein contributed to their more general recognition by the description in his textbook published in 1835. The number of cases since recorded has been very considerable, as may be seen from the facts that Hare was able to tabulate over two hundred and seventy-nine cases of tumors of the mediastinum alone; that Strauscheid analyzed one hundred and twelve; and that among seven thousand five hundred and sixty-six autopsies at the Marine Hospital of Kronstadt, one hundred and fifty-eight were said to have disclosed malignant mediastinal tumors. Nevertheless the number of cases coming under the observation of any one observer has always been limited, and

¹ Read before the Association of American Physicians, at its annual meeting in Washington, May, 1895.

opportunity for accurate clinical study of the various forms and of the successive stages is, therefore, restricted.

VARIETIES.

The forms observed include sarcoma, lymphadenoma, carcinoma, fibroma, lipoma, enchondroma, osteoma, dermoid and hydatid cysts, and the rare variety described by Virchow under the name of teratoma myomatoides. The epitheliomata may be reckoned with the carcinomata; the endotheliomata with the sarcomata. Of all of these forms the cancers, sarcomas, and lymphatic tumors alone occur with sufficient frequency to merit great consideration from a clinical point of view.

The attempt to determine which of the two prominent forms, cancer or sarcoma (for we do not regard it as practicable or possible to separate and distinguish lymphadenoma from sarcoma), is the more common has been repeatedly made, and the results of different observers are strikingly at variance. Hilton Fagge writes that the "vast majority of them are composed of small round cells, and are classified by some observers as 'lymphomata,' by others as round-celled sarcomata." Powell regarded cancer as extremely rare, and pointed out the fact that many of the cases recorded as cancers were probably sarcomata. On the other hand, some of those who have compiled statistics have come to the opposite conclusion. Of Straus-scheid's one hundred and twelve cases, forty-six were carcinomata, thirty sarcomata, and eight lymphomata. Of Hare's cases, one hundred and thirty-four were cancers, ninety-eight sarcomas, and twenty-one lymphomas or lymphadenomas. Our own opinion coincides so closely with that of Fagge and Powell that we have been led to examine with some care the statistical tables of the two above-named authors, and others who have compiled and tabulated cases. The monograph of Hare, containing the largest collection of cases, has particularly excited our attention. It interested us to note, at the first cursory examination of his tables, that for the most part the tabulated cases of cancer antedate those of sarcoma by at least twenty years; and on counting them we found that of the former sixty-one were reported before 1870, and forty-one after that date (in thirty-two the date is not stated in the essay); while of the latter only three were recorded before 1870, and sixty-six subsequent to that year (in twenty-four the date is not given). In other words, the greater number of cases of cancer were observed and recorded when the term cancer was used with notorious laxity; while the sarcomata (omitting the ones in which no date is given), with three exceptions, fall within the period in which observers everywhere distinguish with care between the epithelial and the connective-tissue growths. It is apparent, therefore, that but little value can be attached to conclusions based upon the earlier cases, unless a most careful examination of the microscopic features, and the details of the appearance and manner of growth recorded in each instance, be made and all imperfectly reported instances be excluded. It is questionable, however, whether

the enormous labor such a study would entail would be repaid by the results arrived at. We have, nevertheless, taken the trouble to investigate in this way twenty-five of the older cases reported by their respective authors as cancer, and find in thirteen of these unquestionable evidence of the sarcomatous nature of the disease described; and in the other twelve we were, for the most part, unable to decide. In but one or two were we convinced from the description that the tumor was carcinomatous.

As far as our own cases are concerned, we find of the nine recorded in this paper six were unquestionably sarcomata, and one was unquestionably secondary cancer; of two cases reported some years ago, one was probably a sarcoma of the anterior mediastinum, and the last, though reported to be a cancer by those who made the microscopic examination, was not recorded with the detail we could desire, and the specimen has in the intervening years been lost or destroyed. Omitting these two older cases, there are left the six sarcomata and one secondary cancer. In addition we have studied three other cases of primary mediastinal sarcoma not here reported because clinical notes have not been preserved. This will be found to be representative of the experience of the other observers who have recorded cases within recent years. We do not hesitate, therefore, in the slightest to say that primary sarcoma is overwhelmingly the commonest tumor of the thoracic cavity; and that cancer, even if cancer of the lung not invading the mediastinum be included, is exceedingly rare. We do not include in this discussion instances where small nodules of secondary sarcoma or cancer are found in the lungs or other thoracic organs; but confine our attention to the instances where either single or multiple tumors have reached such size as to merit description as intrathoracic tumors in a clinical sense.

We must recur again to the question of the classification of the tumors spoken of as lymphomata and lymphadenomata; and also of the relation of the latter to leukæmia and Hodgkin's disease. There is, perhaps, no more difficult or obscure question in pathology. Histologically there is no practical difference, if any, between these growths and those which are commonly designated as lympho-sarcomata. There is, however, a wide difference in appearance between the masses of apparently enlarged glands on the one hand, and the large, more or less regular, and infiltrating growth on the other. There is also an evident gross difference between the localized mediastinal tumor and the widespread malignant lymphoma of leukæmia, or Hodgkin's disease, with associated mediastinal involvement. Perhaps, however, after all, the difference is only apparent and dependent upon the point of origin and the local or general diminution of power to resist. Virchow first directed attention to the fact that sarcomatous tumors originating in the remnant of the thymus gland present a more or less regular outline, while such as take their origin from the lymphatic glands of the mediastinum are nodular and irregular. It is the latter that conform to the description of lymphoma, and that are associated with Hodgkin's disease and leukæmia; but cases of the former variety may like-

wise present the clinical manifestations of the diseases mentioned. Thus in a case reported very recently by Palma, a tumor of the anterior mediastinum, which doubtless sprang from the thymus gland, was first regarded in its clinical relations as an instance of Hodgkin's disease, and later there were all of the hæmatological characteristics of leukæmia. A somewhat similar case has been recorded by Eger; and several of the systematic writers, among them Eichhorst, regarded this association as established. In our own opinion there is little doubt that Hodgkin's disease and leukæmia may occur with no other gross lesion than a lymphadenomatous or lympho-sarcomatous tumor of the thymus or lymphatic glands of the mediastinum.

POINTS OF ORIGIN.

Fagge has well remarked that in the later stages it is often difficult, if not impossible, to determine the tissue or structure in which an intrathoracic tumor took origin; but there are numerous instances in which the growth remains so limited in size that the point of origin can readily be made out.

In the first place, it may be noted that tumors of the anterior mediastinum are three or four times as common as those of the posterior mediastinum; and it is not difficult to decide upon the structure from which they most commonly arise.

Thymus Gland.—As has been remarked, Virchow pointed out that sarcomatous tumors of the anterior mediastinum having a regular outline are thymic in origin; and recent observers, particularly Letulle, have argued for a still more frequent occurrence of this place of origin than Virchow believed. New growths of the lymphatic glands, of the fatty or other mesoblastic tissues of the anterior mediastinum, enchondromata, osteomata, and syphilitic gummata springing from the periosteum or bones of the chest walls, all undoubtedly occur, but they are rare. The immense majority of tumors would seem to spring from the remains of the thymus gland. This was undoubtedly true of three of our cases, one here reported and two in which the clinical notes have been lost. In another it was very likely the case. To the *a priori* probability of a tumor originating in the *locus minoris resistentiæ* furnished by the atrophic organ in question, there may be added the more positive evidence afforded by the shape of the growth itself. In two of our cases, one of which is illustrated in the drawing (Plate I.) presented, the largest mass, and therefore that which was probably the primary growth, was divided into two lateral portions which extended downward, tongue-like, over the roots of the great vessels and the base of the heart. The most careless inspection of this tumor could not fail but suggest the likelihood of its being a much enlarged thymus gland.

As to the nature of the new growths occurring in this situation, it is of importance to recognize the histologic construction of this organ. There is,

PLATE I.



Primary sarcoma of the thymus. The tumor covered the root of the great vessels and heart like a cap or bell. It is lifted upward in the illustration, showing the pericardium closely adherent to its under surface and exhibiting the roots of the great vessels and the heart below.

as is well known, a superabundance of lymphoid tissue with a certain amount of endodermic epithelium. The tumors supposed to take origin here may readily be surmised. They are almost exclusively lympho-sarcomata; but the epithelial remnants seem occasionally to be involved, and a few observers, as Letulle, Danzac, and Horstmann, have described epithelial neoplasms arising from these cells. Very rarely other growths, such as cysts or lipomata, have been observed.

Lymphatic Glands.—Next to the thymus gland, the lymphatic nodes are the most common seat of intrathoracic tumors. It may be those of the anterior mediastinum that are affected; but the groups surrounding the lower part of the trachea and the bronchi, and extending into the roots of the lungs, are more commonly involved. They occupy, therefore, the posterior and middle mediastina. The nature of these tumors, when primary, is practically always the same,—lymphomatous or lympho-sarcomatous. There may be widespread lymphatic involvement in all parts of the body, or the thoracic tumor may be alone observed. In two of our observations this was positively the case; in a third it was probable. In a fourth case, here recorded, the tumor was a secondary carcinoma of the peribronchial glands.

Secondary carcinoma of the mediastinal glands is not uncommon, but it rarely occasions masses of sufficient size to be ranked with intrathoracic tumors in a clinical sense. In the case to be reported below this was, however, the case. It is of interest to consider the mode of propagation of cancer from the abdomen (as in our case) to the glands of the chest. The subject has been fully studied by Girode, with whose conclusions we are entirely in accord. Extension, according to this author, may occur by vascular embolism; by direct extension of the disease to the under surface of the diaphragm, through which it penetrates along the lymphatics upward into the chest and glands; and, finally, there may be embolism through the thoracic duct to the chest and then by retrograde embolism to the glands.

Pleura and Lungs.—Very important and interesting tumors are found arising from these structures. We are particularly concerned with the pleural forms, because our experience has been more largely in this direction. One of the most interesting of all tumors is that which has been variously thought to belong to the group of carcinomata or of sarcomata, and which has been designated endothelioma by Wagner, and later by Schulz. All observers are practically agreed that whether it be found in the peritoneum, pleura, or pia mater, the origin may be found in the endothelial cells of the lymphatic vessels, or possibly, at times, the surface endothelium. Opinion varies, however, as to the nature of the growth. To all intents it is indistinguishable from carcinoma in microscopic appearance, though some observers have claimed for it certain distinguishing features in the shape and character of the cells. In our own case (see Plate V.) the cells are in many places distinctly columnar or cylindrical, and even

cuboidal. A characteristic, however, of these growths is the formation of the long columnar structures, which are evidently lymphatic channels filled with proliferated endothelial cells. The whole question of the nature of this growth depends upon the view which we shall take of the embryological origin of the endothelium, for we believe there are few to-day who consider it possible that epithelial tumors may arise from mesoblastic cells. If, then, the more common belief that the endothelium is mesoblastic is correct, and we incline to this view, the endotheliomata are certainly to be classified with sarcomatous tumors; but if the theory of Hertwig of the endodermic origin of the endothelium, to which Balfour and other embryologists more or less conform, be founded in fact, these tumors must be accounted carcinomatous.

The instances recorded in literature as primary cancer of the pleura are probably mostly endotheliomata. Of such Neelsen was able to collect four undoubted instances, and added a fifth. In addition, he gave a partial description of another in the Pathological Museum at Rostock, and referred to three other imperfectly reported and questionable cases in literature. Birch-Hirschfeld has described one in his text-book, and Coats, of Glasgow, described one coming under his notice. Recently Stewart and Adami, of Montreal, have reported, under the title of "Angiosarcoma," what may not improbably be a variety of the same form of growth. Our own case was presented before the Philadelphia Pathological Society during the past winter, and subsequently two other—certainly similar, if not identical—cases have been exhibited in the same society. Fränkel has also recently described at some length the same form of tumor, basing his study upon a typical case. We have little doubt that many instances have been overlooked, the appearance of the pleura being such that the disease could very easily be mistaken for chronic inflammatory thickening.

The growth is nearly always found in the form of a uniform infiltration of the pleura, the latter having a glistening whiteness. Sometimes a small amount of chylous liquid exudes from the surface of section. Either the costal or pulmonary pleura alone, or both, may be involved, and adhesion of the two reflections is frequently noted. The thickening varies from a few millimetres to several centimetres. The inner surface is usually smooth, but may show nodular elevations or a net-work constituted by the distended and infiltrated lymphatic vessels. The thickened pulmonary pleura may be sharply defined and separable from the underlying lung, or there may be, as in our own case, infiltration of the lung-substance to a considerable distance. Metastasis is not the rule, but may occur.

Of less interest pathologically, though more important clinically because more frequent, are the ordinary sarcomata of the pleura. These may be round-celled or spindle-celled, and tend to involve the lung-structure as well as the ribs and tissues of the chest wall. Dr. Coats has called attention also to a form of subpleural fibro-sarcoma which occurs as a rounded mass covered by the pleura and is particularly common in children.

PLATE II.



Primary sarcoma of the peribronchial lymphatic glands, invading the root of the left lung. Posterior view, showing the mass in the posterior mediastinum, surrounding the oesophagus and presenting a deep furrow where the aorta was imbedded. Secondary nodes are seen in the pleura.

PLATE III.



View of the same lung laid open by a section from apex to base and from the external surface toward the root of the lung, showing the sarcomatous tumor springing from the lymphatic glands surrounding the bronchus in the root of the lung.

Fibrous, fatty, and calcareous tumors of the pleura are rare.

Of the tumors of the lung we shall have little to say, mainly because our experience in this direction has been limited. In a number of instances we have observed secondary sarcomata and carcinomata, but in none of these did the pulmonary lesion dominate the case. Of the primary tumors the cancers are more common than sarcomata, though there is, not rarely, primary sarcoma of the lymphatic nodes surrounding the bronchi within the lung near the root. (See Plates II. and III.) These are to all intents tumors of the lung itself, but classification is simplified and strict anatomical requirements better fulfilled by regarding them, as we have done, among the tumors of the lymphatic glands of the middle and posterior parts of the mediastinum.

To make ourselves perfectly clear, we would point out that the clinical manifestations in such cases are practically the same as in cases where the glands around the bronchi outside the lung are involved, and anatomically these intrapulmonary lymphatic glands belong strictly to the same group as those around the bronchi, outside the lung.

As to the primary carcinomata of the lungs, no little difference of opinion has existed regarding their point of origin. Some observers insist that they spring from the surface epithelium of the bronchi; others maintain that the mucous glands of the bronchial mucosa are the starting-point; while still others regard the alveolar epithelium as the point of origin. It would seem, however, from a dispassionate study of the work done in this field, that each of these views in part expresses the truth. The entire subject, however, requires more extended study based upon modern pathological methods and classification.

Œsophagus.—Finally, the œsophagus is at times the starting-point from which malignant growths invade the mediastinum. In most instances of œsophageal carcinoma the tumor is of small size and exerts but little outward pressure, and does not extend beyond the outer covering of the tube. There are cases, however, in which these tumors reach considerable dimensions, exercising injurious pressure; and there are other cases in which a direct infiltration of the posterior mediastinum and lungs takes place. Interesting examples of this character have been recorded by Stevens and by Fränkel. Ziemssen, Mackenzie, and others have in particular called attention to œsophageal tumors as a cause of laryngeal palsy by pressure upon the recurrent laryngeal nerves.

CLINICAL MANIFESTATIONS.

The symptoms of mediastinal and other intrathoracic tumors are mainly due to pressure. The same may be said of aneurism, which to all intents is a tumor; but there are differences of a very essential kind in the successive development of the symptoms in the two cases, and careful study of the manifestations, seen from first to last in cases of mediastinal growths, will go far to facilitate accurate diagnosis at any stage of the disease.

First of all, it is to be noted that there are instances of latent intrathoracic tumor in which there are neither distinctive symptoms, if indeed there be any, nor physical signs. Instances of this kind occur in every large series of autopsies. On the other hand, it is usual to find marked symptoms or marked physical signs, or both combined. The classification of these cases from a clinical point of view, which seems to us most likely to be productive of useful results, in rendering the subject clear and diagnosis accurate, is based upon the prominence on the one hand of symptoms, or on the other of physical signs.

We may distinguish three groups, remembering, of course, the fact that mixed cases are apt to occur. These groups are: 1, that in which the anterior mediastinum is the seat of the growth, and in which physical signs are likely to be prominent; 2, that in which the middle and posterior portions of the mediastinum are involved, and in which the symptoms predominate over the physical signs; and, 3, that in which the pleura or superficial portion of the lung is involved, and in which the symptoms and physical signs are of equal prominence. There are, of course, wide variations from any such artificial scheme, and transitional cases are of frequent occurrence.

It is not our present purpose to speak exhaustively of the symptoms of intrathoracic tumors, but rather to sketch the outlines and to illustrate the subject as far as the clinical material that has come under notice will permit.

I. Intrathoracic Tumors situated in the Anterior Mediastinum.—Tumors of this situation lie immediately under the sternum, which is frequently pushed forward, and may, in rare instances, be eroded. Physical examination reveals an area of abnormal dulness or flatness to percussion, having a more or less irregular shape. There may be a certain amount of pulsation, but this is rarely marked, and practically never is there a sharp diastolic shock. If the growth extends upward sufficiently far, it may be possible (as in Case I.) to feel an abnormal mass in the depths of the suprasternal fossa. Not rarely these tumors give rise to secondary nodes in the cervical lymphatic glands. Auscultation over the area of dulness may be entirely negative, but in not a few cases the breath-sounds and heart-sounds are well transmitted. The pressure exerted upon the aorta or root of the pulmonary artery may be such that a distinct systolic bruit results.

The symptoms are mainly dependent upon the pressure exerted upon the venous trunks, the superior vena cava, the right and the left innominate veins. These vessels, less resistant than the neighboring arteries, early suffer compression and may be invaded by the growth which penetrates their walls and proliferates within, or there may be complete occlusion by thrombosis. The result of these conditions is distention of the veins of the upper extremities, the head, neck, and upper part of the chest. Coldness, lividity, œdema, and clubbing of the finger-ends result, and the venous channels may be greatly dilated and tortuous. Pressure upon the arteries

is of less importance, on account of the rigidity of their walls, but inequality of the radial pulses has sometimes been observed. The nerves of this portion, and in particular the inferior laryngeal, are often involved. Hoarseness and aphonia are frequent symptoms. A number of cases are recorded in which the sympathetic was compressed, with resulting inequality of the pupils. The trunk of the vagus is less frequently involved than in the cases in which the tumor occupies a plane more posteriorly, or, at least, if this nerve is involved, characteristic symptoms will be wanting, for reasons that will presently be discussed. Not infrequently acute pericarditis or pleurisy with pain and effusion supervenes. When the tumor reaches a large size, dyspnoea is likely to be present, and may be marked; and the same symptom occurs when extension of the growth has taken place posteriorly. The general appearance of the patient furnishes no positive indications; emaciation and anæmia are usually present, but true cachexia is rare. In our experience this absence of cachexia is more frequent in malignant growths of the anterior than of the posterior mediastinum or of the pleura and lungs. Pain may be present and may be decided, but is, on the contrary, frequently absent. In general it is a much less prominent indication than in aneurism.

The following case is one of primary sarcoma of the thymus gland, in which, however, at the stage at which it came under observation extension had taken place to the neighboring lymphatic glands, to the posterior mediastinum, and to the abdominal lymphatic nodes. (See Plate I.) There was also a complicating pleural effusion of dropsical character. The diagnosis was readily made by the distended veins, clubbed fingers, enlarged glands of the neck, the palpable tumor in the suprasternal fossa, and the physical examination of the chest. Unfortunately the history was not obtainable, and the progress of the symptoms could not be ascertained.

CASE I.—G. B., a Hungarian lad, aged twenty years, was treated in the wards of the University Hospital during December and January, 1893-94. It was impossible to get from him any intelligible statement of his previous health or of the progress of the illness which brought him to the hospital. He was a miner, and had been at work in the anthracite coal-mines of Eastern Pennsylvania as late as October, 1893. He stated, however, that he had been ill for six months before he entered the hospital, and that he had suffered principally with shortness of breath.

The following notes were recorded at the time of his admission:

Inspection.—The patient presents a remarkable appearance in his features and posture. The eyes are somewhat protruding, the face is puffed, patchy flushing is noted from time to time about the cheeks and chin, and the forehead is covered with large sweat-drops. The neck is swollen, and its circumference just above the clavicles is decidedly greater than that above. The posture habitually assumed is one in which the patient leans forward and to the right, resting his weight on the right elbow. At first sight, he has the appearance of a kyphotic; but there is no curvature of the spine, excepting that the lumbar portion is rather convex than concave. The veins of the neck, upper thoracic region, and lateral portions of the abdomen are greatly distended. The hands are cold and cyanotic; the fingers are club-shaped. The

sternum is prominent above, and the lymphatic glands of the neck project as knobs. The antero-posterior diameter of the body is everywhere greater than the lateral.

Percussion.—The percussion-note over the right lung is hyper-resonant anteriorly and posteriorly. Liver-dulness begins at the sixth rib. The left lung is also hyper-resonant above, but below a line passing through the nipple and angle of the scapula the note is dull. This dulness is movable and evidently due to fluid. In the central part of the chest is found an area of dulness bounded to the right by a line running from clavicle to liver-dulness, one-half inch to the right of the sternum; on the left by a diagonal line extending from the clavicle one-half inch outside the sternum downward to a little beyond the left nipple, then vertically downward to the seventh rib and horizontally over to the liver-dulness. This area is resistant and completely flat on percussion. There is cardiac pulsation somewhat below the usual point and not distinct.

Palpation.—The apex-beat is discernible only as a diffuse or indefinite jogging in the situation indicated. Vocal fremitus is distinct everywhere over the right lung. On the left side it is exaggerated above the mediastinal dulness and the pleural effusion before indicated.

Auscultation.—The breath-sounds on the right side are soft and prolonged, especially the expiration; occasionally sonorous râles accompany the latter. On the left side the breathing is exaggerated, except at the lowest point of pulmonary resonance, where there is distinct bronchial breathing. The heart-sounds are weak and muffled. The second sound is accentuated at both pulmonic and aortic cartilages. There is no murmur. The radial pulses are extremely tense and cord-like, but are compressible. There is no atheroma. The pulse-wave is quite vigorous, and decidedly more so on the left than on the right side.

Examination of the *superficial glands* shows them to be enlarged in various situations. In the neck are found a large number of separately enlarged nodes, but in the lower part of the neck, on the left side, is found one group of glands fused homogeneously. The axillary glands are similarly enlarged, and the epitrochlear very slightly. Deep palpation in the suprasternal fossa reveals a globose mass behind the manubrium. This has the faintest trace, if any, of pulsation. There is no tracheal tugging.

The examination of the *blood* showed 2,930,000 red corpuscles, 9370 leucocytes, and 55 per cent. of hæmoglobin. There were more than the usual percentages of eosinophiles and lymphocytes, and the red corpuscles were quite irregular in size.

Examination of the *urine* showed: specific gravity, 1026; acid; no albumin; no sugar; deposit of amorphous urates.

The *abdomen* was greatly distended by tympany, and on firm palpation there seemed to be an intra-abdominal growth high up. This could, however, not be accurately determined.

On December 27 the note reads: Cardiac impulse to-day is very marked at the xiphoid cartilage. The patient has been growing more uncomfortable, and dyspnœa is increasing.

On January 1 it was noted that the dulness at the lower part of the left chest had increased and was distinctly movable. It was also noticeable that the veins of the chest became distended during expiration and collapsed during inspiration.

On January 11 the feet and legs were very œdematous. Orthopnœa was growing decided. The abdominal walls were distended by tympany and the mass within. The venous net-work on the front of the chest was very pronounced. The arms were livid. The left pulse was distinctly fuller than the right; the pupils were equal and reacted normally to light.

On January 12 distinct leucocytosis was noted, and there were many microcytes and macrocytes, but the exact blood-count was not recorded. The temperature-

chart has unfortunately been lost, but there were frequent slight elevations, and towards the end of life there was almost constantly some degree of fever.

Autopsy.—On opening the thoracic cavity a large tumor was found, occupying mainly the anterior mediastinum. This was somewhat irregularly nodulated and lobulated, and extended over the root of the great vessels and heart, much like a bell or cap. The lower surface was intimately attached to the pericardium, but the inner surface of this membrane was perfectly smooth and not involved in the growth. The mass enveloped all of the great vessels, together with the trachea, and, to a less extent, the œsophagus, the bronchi, and the nerves of the posterior mediastinum. It extended backward on each side over and around the bronchi and vessels at the root of the lung, particularly on the right side, and was continuous with a smaller and somewhat denser growth in the posterior mediastinum, which extended downward to the diaphragm. None of the vessels were completely occluded, but the right innominate vein was greatly compressed. In the posterior mediastinum the œsophagus, aorta, nerves, and veins were all surrounded by the mass. On a closer examination the growth anteriorly was found to contain numerous areas of softening and of cystic formations, the former containing cheesy material, and, in some places, calcareous particles quite abundantly; the latter areas, dark grumous liquid. The left pleural cavity contained a considerable quantity of clear serous liquid, but there was no involvement or inflammation of the pleura itself. The left lung was somewhat compressed and œdematous. The right pleura and lung were normal. The abdomen contained a second and huge growth, which occupied the upper portion of the cavity and was situated for the most part behind the peritoneum surrounding the aorta and its branches, and the vena cava as far down as the iliac branches. The greatest mass of the tumor, however, was above. It extended, also, forward to the root of the mesentery and surrounded some of the coils of intestine. This tumor was lobulated, and presented an appearance like that of greatly enlarged lymphatic glands which had softened and undergone some calcareous deposition.

Microscopical examination of portions of the large mediastinal mass and of fresh nodules on the outer wall of the pericardial sac showed small, round cells with delicate fibrous stroma. The tumor may be regarded as a round-celled or lymphosarcoma.

A second case reported some years ago by one of the writers (Dr. Pepper) was, in all probability, similar to the last, but was marked by the prominent part assumed by complicating inflammation and invasion of the pleura. Points of interest as bearing on the diagnosis were the persistent pain and extreme orthopnoea, with the irregular character of the physical signs, all of which pointed to something more than simple pleural effusion.

CASE II. (*Trans. Phila. Path. Society*, vol. vii. page 71.)—The case was under the care of Dr. T. J. Yarrow, with whom Dr. Pepper saw it in consultation. The patient was an active business-man, aged fifty-six years. There was no predisposition to cancer. He had been subject to a bronchial cough for years. In May, 1876, he had an attack of acute malarial fever of short duration. A month later he came under observation with a marked effusion of the right pleural sac which caused violent orthopnoea. There were localized chest pain, absence of respiratory murmur, and dulness on the right side. These signs gradually diminished, and after a month he was much improved. During this period, also, there were heavy coating of the tongue, torpid bowels, and scanty urine. After he began to go out there was a return of the effusion and dangerous orthopnoea; this was in September. Distinct prominences, with severe pain, were now first noted. The earliest prominence to appear was over the ninth rib of the right side, four inches from the spine. The

second was below the sternal end of the right clavicle; the third on the right side, in the line of the armpit, about the tenth rib. The signs of the second pleural effusion never entirely disappeared, and there was no subsidence of the pain.

Early in October the following conditions were noted: There was great emaciation but no cachexia, though there was great pallor. There was profuse sweating at irregular periods, and sometimes so profuse as to require several changes of clothing. Sleep was disturbed by continuous and progressively increasing pain, which was specially marked over the prominences, and also along the nerves of the right arm. There was a severe, dry cough. The right chest was enlarged, and the heart was displaced towards the left side. Irregular dulness was discovered by percussion of the right side. At the apex anteriorly the note was dull; posteriorly there was complete flatness. The lower part of the lung anteriorly was resonant. There was no change in the distribution of dulness when the patient changed his position. Faint and distant bronchial breathing was heard posteriorly; over the resonant area in front the respiratory murmur was normal. There was no distention of the veins of the face, neck, or right arm. The prominences increased in size. The effusion did not largely reaccumulate after a second aspiration. Great loss of flesh and strength, with severe cough, and excessive pain preceded death.

At the *autopsy* a large mass resembling an encephaloid sarcoma was found in the anterior mediastinum. This was attached to the sternum and also to the outside of the pericardium. The heart was displaced towards the left. The pericardium showed evidence of an old pericarditis. On the right side, corresponding with the prominences already described, were extensive cancerous masses. In the case of the one over the apex in front, the morbid growth also involved the intercostal tissues and the second and third ribs. The mass on the posterior surface was very large and very extensive, and involved both layers of the pleura, and also the superficial layer of lung-tissue at a few points. It reached from about the third rib down to near the diaphragm, and was fully one inch thick in some places. The mass low down on the side was smaller, also involved both layers of the pleura, and was continuous with a large growth which involved the whole thickness of the diaphragm. The anterior part of this muscle was chiefly affected; the growth in places was fully one-half to two inches in thickness, and the disease extended across to the median line, where it was continuous with the mediastinal growth before described. At one spot over the convexity of the liver there was an extension of cancerous disease to the capsule and superficial layer of the tissue of that organ. There was no pleural effusion. The lung itself contained but a few cancerous nodules, and was for the most part wholly crepitant excepting the apex and posterior parts, which were œdematous. The liver was enlarged and congested; the other organs were healthy.

The microscopical examination was not made, but there can be little doubt that this was an instance of sarcoma of the thymus, with secondary extensions.

II. *Intrathoracic tumors situated in the middle and posterior portions of the space around the bronchi, œsophagus, aorta, and nerves of these regions* are particularly apt to produce marked symptoms, even before the tumor has reached large size. We have seen an aneurism no larger than a pigeon's egg cause the most violent dyspnœa possible, and cases of pronounced symptoms due to tuberculous peribronchial glands in children are not unusual; but our experience has not included a case where a tumor of small size has acted in this way. It does occur at times, however. The most decided symptom, as a rule, of tumors in this situation is dyspnœa, which

may increase to highest grade of orthopnœa. The inspiration is often painfully labored and strident; recession of the supraclavicular and supra-sternal fossæ and of the base of the chest is often marked. Cough is usually present and may vary widely in character. Sometimes it is loud and ringing; at other times constant and hacking. The sputa are muco-purulent as a rule, but not rarely are blood-stained, particularly when penetration of the bronchial wall has occurred; and even particles of the tumor may be expectorated. When the vagus is compressed or involved there is a peculiarly paroxysmal form of cough, often with a whooping quality, and attended at times with paroxysms of dyspnœa as well. This may occur where but one vagus is involved, though experimentally both must be cut to produce analogous symptoms. Sir William Gull explained this by showing that in case of only one of the nerves being cut the impulses travelled to the opposite side through the pulmonary plexus, whose anastomosis is very free. In case of tumors, however, the pulmonary plexus is apt to be coincidentally involved, and disease of but one nerve is necessary to cause the symptoms. This explanation serves to show also why the symptoms indicated are more common in cases of involvement of the vagus in the posterior mediastinum than when it is implicated in a mass high up in the anterior mediastinum and neck. The same disease of the vagus is invoked to explain the attacks of vomiting, and the seizures of cardiac palpitation, irregularity, or syncope at times observed. Pressure upon the azygos veins may occasion œdema of the upper part of the abdomen and serous effusions of the chest; not rarely pleural effusions are due to complicating inflammation or neoplasm of the pleura.

Tumors of the posterior mediastinum more commonly cause rapid emaciation, and partial, if not typical, cachexia. This may be due to the greater intensity of the symptoms, the greater frequency of involvement and destruction, by pressure-necrosis or ulceration, of the lung-substance; and sometimes in particular to pressure upon the œsophagus and thoracic duct. Dysphagia is a pronounced symptom in some instances, and may for a long time be the only one, though this is unusual. Deep-seated pain is sometimes complained of, and in rare instances darting neuralgic pains radiate along the nerves.

Fever is more likely to occur in growths of the posterior mediastinum than in those of the anterior. Bennett first drew attention prominently to this as a symptom of glandular tumors of the chest, but elevations of the temperature may occur in any case. Usually the elevations are slight, but where there is considerable pressure upon the bronchus and lung, and particularly in cases of ulcerative carcinoma, high and irregular fever and marked sweating have been noted. Where the circulation is greatly impeded, and this applies with peculiar force to anterior mediastinal tumors, depression of the body-temperature has often been observed.

The following case illustrates very well the symptoms in a case of tumor of the posterior mediastinum of moderate size. One peculiarity of note

was the dulness on percussion over the left lung anteriorly. There was neither pleural effusion nor involvement of the tissues in that situation by new growth to explain the physical sign; and in all probability it depended upon alteration of the intravesicular tension due to compression of the left bronchus.

CASE III.—M. K., aged seventy-five years, was admitted to the medical ward, presenting the following conditions: She was much emaciated and of an extremely anæmic appearance. The striking and practically the only symptoms were extreme dyspnœa and restlessness. The patient lay on the side, but moved continuously from the one side to the other. Physical examination revealed marked dulness over the anterior part of the left chest, with diminished respiration. There was a systolic cardiac murmur and apparently hypertrophy of the heart. There was no particular change in the symptoms, and the patient soon expired.

Autopsy.—The pericardial and pleural sacs were normal; the heart was enlarged. At the root of the left lung was found a mass of solid tissue, pressing upon and enveloping the left bronchus. This mass was continuous with a similar new growth enveloping the trachea and other structures of the posterior mediastinum. On section, the tumor was found to be composed of a mass of altered lymphatic glands; it was of a gelatinous appearance, and exuded a viscid, milky liquid. Numerous small nodules were found in the pericardium and pleura of the left lung adjacent to the tumor. Microscopic section showed this to be a lympho-sarcoma.

The next case was one of secondary cancer of the glands of the posterior mediastinum in which the symptoms and physical signs were scarce marked enough to warrant a diagnosis, and, indeed, this had not been made. The dyspnœa did become quite extreme immediately before death, but there was a high grade of cachexia and asthenia, and there was neither any stridor nor any definite physical sign of tumor.

CASE IV.—X. Y., an old lady, under observation with symptoms pointing to cancer of the stomach, was noticed to become more and more dyspnœic and to have more or less cough. Physical examination failed to reveal any condition of the heart or the lungs likely to produce these symptoms, but it was remarked that the respiratory murmur was decidedly lessened. This was as marked on one side as the other. She was emaciated to an extreme degree, and soon died of exhaustion. At the autopsy a large pyloric carcinoma with dilatation of the stomach was discovered, and there was a mass of enlarged lymphatic glands the size of a large apple in the posterior mediastinum at the roots of the lungs. The bronchi were pressed upon, but not seriously; and there was no involvement of other structures. Microscopic examination of the gastric tumor and of the mediastinal glands confirmed the diagnosis of carcinoma.

In the following case the tumor had evidently begun in the posterior mediastinum, but at the time it came under observation the symptoms of a complicating pleural involvement and of pleuritic effusion were even more pronounced than those of the original mediastinal disease. (See Plates II. and III.) Definite aid was rendered in the diagnosis of this case by the swelling of one of the ribs, and by the removal through aspiration of

intensely hemorrhagic liquid. The case was seen in consultation with Dr. J. L. Forwood, of Chester :

CASE V.—Mr. D., aged fifty-four years, had been a good liver. There was no specific history. His illness began insidiously about seven months before he came under observation, and developed progressively. The main symptoms were progressive dyspnoea, increased by exertion; cough of a somewhat paroxysmal character; and later intense pain referred to the side and upper part of the left chest. The sputa were sometimes bloody. Emaciation was moderate, but there was marked pallor, though no distinct cachexia. The temperature was little if at all elevated. There was little sweating. Towards the close of his life the position of greatest comfort was sitting upright and leaning well forward. A painful swelling of the fourth left rib in the axillary line appeared about two months before death.

Physical examination, shortly before death, showed marked impairment of expansion of the upper part of the left chest. The heart was somewhat but not greatly displaced, and was apparently normal. The enlargement of the rib was visible and palpable, and was the seat of pain and tenderness. It seemed firm to the touch. Over the upper lobe of the lung, both front and back, there was great decrease of the vocal fremitus and resonance, with absolute flatness on percussion, and an extremely weak respiratory murmur. Over the lower lobe of the lung the percussion was full and the breath-sounds were almost normal. The right lung seemed entirely normal. There were no physical signs pointing to aneurism.

Exploratory puncture of the upper part of the left pleural sac was performed, and marked hemorrhagic fluid was withdrawn. This was submitted to microscopic examination, but no distinctive elements were discovered. Death occurred soon after this time.

The *autopsy* was performed the day after death. The swelling and bulging of the fourth rib were still quite apparent. On opening the thoracic cavity there was found a considerable quantity of bloody liquid in the upper part of the left pleural sac. The lung itself was pressed downward and against the chest wall. It was soft and oedematous, and was easily torn by the fingers in the attempt to remove it. Opposite the external swelling alluded to there was a mass of tumor-tissue which had involved the rib and invaded the pleura and lung within. The rib itself was somewhat eroded and brittle. The tissues of the chest wall were considerably infiltrated as far outward as the superficial muscles and for an inch or more around the point of greatest bulging. The lungs were removed together, and with the heart attached. There was then discovered a mass of tumor situated at the root of the left lung and extending around the descending aorta, trachea, and other structures of the posterior mediastinum. In particular, however, this tumor invaded the substance of the left lung as a dense white mass, marked in numerous places by darkly pigmented lymphatic glands. Many of the latter were involved in the disease, but some were apparently healthy and merely surrounded by the growth. The edge of the tumor where it merged into the lung-tissue was rather sharply defined, but did not show any evidence of the formation of a capsule. The lung-substance was so compressed and oedematous as to present the appearance of a pulpy mass. Posteriorly and laterally the mass approached the surface and involved the pleura; and it was in this way that the attachment to the fourth rib and its involvement had taken place. Some of the glands at the root of the right lung were involved, but there was no extension of the disease into the lung-substance. The outer surface of the pericardium was involved, but within the membrane was healthy. The heart and other organs were not invaded. A large calculus was found in the pelvis of the left kidney, also a quantity of gravel.

The tumor, though it surrounded the bronchus of the left lung, the trachea, and

to a large extent the aorta, did not cause serious compression of any of these structures.

Microscopic examination of the growth showed it to be a lympho-sarcoma.

In the next case, though the autopsy revealed involvement of both the anterior and posterior mediastinal spaces, the earliest symptoms referred to the latter, and throughout the case the prominence of these symptoms and the absence of physical signs indicative of tumor of the anterior mediastinum leave little doubt that the origin was in the posterior space. The specimens in this case have unfortunately been lost, and there must remain a certain amount of doubt as to the exact point of origin, if not of the nature of the tumor itself. The Committee on Morbid Growths of the Philadelphia Pathological Society reported that the tumor was carcinoma. There are facts, however, even disregarding our present knowledge of the greater rarity of carcinoma, which would incline us to the view that this was a case of sarcoma after all. The latter form of new growth is certainly more apt to occasion "disease of the glands in both the anterior and posterior mediastinum, forming masses of considerable size." Carcinomatous tumors are more likely also to undergo degeneration or ulceration and neurotic breaking down of surrounding structures than was the case in this instance. If this was indeed a cancer, the point of origin was probably either the œsophagus or the root of the right bronchus. Against the latter view, and we might say, at the same time, against the view of the cancerous nature of the disease, was the fact that the right bronchus was merely compressed and not penetrated; the œsophagus is said to have been "embedded." We are strongly of the opinion, therefore, that the case was one of sarcoma of the glands of the posterior mediastinum in the first instance, following which more general glandular involvement occurred.

CASE VI. (*Trans. of the Path. Society of Phila.*, 1878-79, vol. ix. p. 171.)—The patient, a blacksmith, aged forty years, was admitted to the Philadelphia Hospital presenting the signs of a large pleural effusion on the left side, extreme dyspnoea, husky, whispering voice, and slight dysphagia. The history was obscure, though it appeared that for two years there had been occasional dysphagia and increasing huskiness of voice; and that for three months there had been increasing dyspnoea. On examination the physical signs of pressure on the right bronchus were detected, and some enlarged and hard lymphatic nodes were found in the left supraclavicular space. The diagnosis was made of primary cancer of the intrathoracic glands pressing on the right bronchus, œsophagus, trachea, and azygos vein. Death occurred suddenly from collapse. The autopsy revealed cancerous disease of the glands in both the anterior and posterior mediastinum, forming masses of considerable size. The right bronchus was compressed. The œsophagus and descending aorta were partly embedded in the cancerous growth. The azygos and hemiazygos veins were involved, and so embedded that it was impossible to dissect them out. A large pleural effusion existed on the left side.

The Committee on Morbid Growths, to whom the specimen was referred, reported: "The specimen . . . is found, by microscopic examination, to consist of fibrous-tissue stroma arranged so as to form alveolar spaces, in which spaces are seen

epithelial cells. This arrangement of structure is characteristic of carcinoma,—variety scirrhus. The enlarged glands from the neck have undergone a similar metamorphosis, as shown by microscopic examination.”

III. *Tumors originating in the Pleura and Lung.*—The third place of importance from which intrathoracic tumors are found to spring is the pleura. In very many of these there is soon a certain amount of involvement of the underlying lung-structure, and, indeed, it is quite likely that in some instances the growth, though seemingly pleural in origin, first involves the subpleural tissues.

The symptoms in these cases may be exceedingly puzzling. In a great majority of cases the first diagnosis is pleurisy. This is justified by the apparently sudden onset of many cases, the sharp pains in the side, cough, the development of dyspnoea, and the detection later of signs of effusion. There are, however, marked differences even in these symptoms in malignant disease and simple inflammation of the pleura. In the former the pain is generally much sharper and less dependent upon the movements of the chest, and it shows less tendency to abate. In addition, radiating pains are often found to traverse the intercostal nerves or the nerves of the neck and arms. The cough is more persistent and more irritating, and if the lung has become involved bloody sputa may be expectorated. In some cases the diagnosis has been positively established by the detection of characteristic cells or groups of cells in the sputa. This has naturally been more frequent where the lung was primarily diseased than where the pleura was the place of first involvement. Many observers have found particles of cancerous tissue, and several were enabled to diagnose the less ulcerative sarcoma (Huber, Hampeln, Kroenig, Eichhorst). Hairs have been found in the expectoration in dermoid cysts, and hooklets in cases of hydatid disease.

When pleural effusion is present the difficulty of diagnosis may be even greater than before. It is noticeable, however, that in many cases the physical signs are very irregular and sacculation of the effusion is frequently present; or without distinct sacculation it may be noted that the physical signs do not change with changes in the position of the patient. Finally, exploratory puncture is of the greatest service. The liquid thus obtained is almost always hemorrhagic, more so, as a rule, than in any other form of pleural disease. Microscopically, it has been shown by several observers that there is an excess of fatty matter in the form of oil-drops; the liquid may indeed be decidedly chyliform. This fatty character was claimed for cancer alone by Quinke and Boegehold; but Fränkel saw it in a case of sarcoma. The last-named observer insists also on the diagnostic value of certain large, swollen cells, which he maintains are merely altered endothelium, but which seem to become detached and transformed in this manner only in cases of pleuritic disease of malignant character. Altogether, aside from this question of the character of liquid withdrawn, important information is not rarely given in the operation itself by the resistance offered to

the trocar. Twice our suspicions have been confirmed in this way in malignant disease of the pleura.

The general appearance of the patient is, as a rule, quite different from that of a person suffering with ordinary or even tubercular pleurisy. Rapid emaciation and extreme anæmia are frequent, and cachexia, though not so frequent as we might expect, is occasionally noted.

When secondary growths are deposited the diagnosis becomes almost certain. If the lung is involved, as in one of our cases, extreme dyspnoea and cough are noted, and the physical signs may give important aid. When the pleura is involved near the apex, primarily or secondarily, hoarseness and other signs of implication of the recurrent laryngeal nerve are of frequent occurrence; and, finally, the nature of the disease can scarcely be in doubt when, as so frequently occurs, the ribs are invaded or bulged by large masses within.

We proceed now to detail the three cases of our series in which the pleura was primarily involved. In two of them we confess there must remain a reasonable doubt as to whether or not there was involvement, first of all, of the subpleural pulmonary tissue in the one, and of the periosteum of the rib in the other. Our own opinion is in favor of the pleural origin; but we shall recur again to this after detailing the cases in question :

CASE VII.—E. J. B., aged seven years, came under observation in May of 1894. He lived in a distant part of the city, and was placed under the care of Dr. Moylan, to whom we are indebted for the clinical notes. His previous health had been entirely good, but for several months previous to May, while attending school, he began to ail. Later he complained of severe pain in the left side near the lower border of the ribs in front. His attendant at that time diagnosticated pleurisy, and evidently thought lightly of it, as the patient was permitted to continue at school. The pain was always aggravated by gastric derangement, particularly by flatulency, and the child continued to lose flesh and strength, so that the father was obliged to take him from school. He was sent to the sea-shore, but did not recuperate. When he first came under notice, in the middle of May, the child was highly emaciated. On physical examination the apex-beat was seen to be displaced almost to the right axillary line. The left intercostal spaces bulged, and there was almost complete absence of the respiratory murmur, with flatness on percussion from about the third rib downward. There was no fever. He had no appetite; and severe paroxysms of pain in the left side and loss of sleep aided in reducing his vitality. There was practically no cough or expectoration.

The child was put to bed and carefully fed. Heart-tonics were administered, and after a few days an exploratory puncture was made with negative results. Sarcoma of the lung and pleura was now diagnosticated by exclusion, but a resection of the rib was performed, and the diagnosis was completely confirmed. The operation was performed in the hope that it might prove otherwise. The child's condition deteriorated steadily, and he died a few days later.

At the *autopsy* there was found a rather circumscribed, whitish, soft tumor of the antero-lateral portion of the base of the left lung. This was about the size of a small orange; in places it seemed almost encapsulated, but in front was firmly attached to the sixth rib, and invasion of the intercostal tissues had occurred. Above and inward, the lung bordering on the tumor was highly œdematous, compressed, and pulpy. There was some slight infiltration from the growth. The upper part of the

PLATE IV.



Left lung of case of primary sarcoma of right pleura with secondary involvement of both lungs.

pleural cavity contained a small amount of bloody fluid. All of the other organs were normal.

The microscopic examination showed the growth to be a mixed sarcoma. Most of the cells were small and round, but some were spindle-shaped or irregular.

As to the origin of this growth, we admit there is some doubt. In places it seemed to be covered by pleura, and this appearance suggested the form of subpleural sarcoma referred to by Coats and others; but the centre of involvement seemed on the whole rather to be the pleura itself, with extension inward to the lung on the one hand, and outward to the periosteum of the rib and to the intercostal tissues on the other.

The case is of interest also from the early age of the patient. This is not an unusual feature of intrathoracic tumors, however, as will be seen from the fact that Edwards has tabulated some thirty-seven cases in his article in Keating's "Cyclopædia of Diseases of Children," and from our own experience. We report in this series three cases, in which the ages were respectively seven, thirteen, and twenty years, and have seen several others in the service of colleagues and in consultation practice. Of course, the number becomes very considerable if we include cases of tuberculous disease of the glands of the chest.

The next case was not seen during life by either of us, but through the kindness of Dr. Thomas P. Tyson, of Jenkintown, one of us was permitted to make the post-mortem examination, and we are indebted to him also for the clinical notes (see Plate IV.):

CASE VIII.—J. McC., a lad, aged thirteen years, had been ill for several months before his death. He had complained of great loss of strength, and had a persistent cough, with more or less shortness of breath, but with little expectoration. In addition he suffered much pain in the right chest, especially in the upper part. The illness seemed to follow directly upon an injury of the upper part of the right chest, in the situation indicated by the pain. Previous to the time of this injury the boy had been healthy, but smoked cigarettes immoderately. The cough was most persistent and sometimes distinctly paroxysmal; towards the end it was accompanied by more expectoration, the sputa being muco-purulent in nature. He became very much emaciated at last, but never presented a distinctly cachectic appearance. There was from the first considerable perversion of appetite. Physical examination revealed a swelling or bulging of the second rib of the right side at about the anterior axillary line and engorgement of the veins of the neck. There was decided dulness on percussion over the upper part of the lung, with absence of breath-sounds. Below the lung was resonant, and moist râles and crepitation were discovered, accompanying harsh respiratory sounds. Percussion-resonance on the left side was full until shortly before death, and mucous râles were constantly present. These symptoms and physical signs continued with but little change until the boy's death, but the dyspnoea, later orthopnoea, and emaciation steadily increased. The temperature ranged from the normal to 101° F., and the pulse from the first was rapid,—110 to 120 per minute. The swelling of the rib and the persistent cough and dyspnoea led Dr. Tyson to diagnosticate sarcoma of the lung, and in this opinion he was supported by two consultants.

The *autopsy* was performed by one of the writers (S.). The external appearances were the same as above described. On opening the thoracic cavity there was

found a considerable quantity of pleural effusion of serous nature in both sides. Attached to and involving the third rib of the right side and invading the lung was a hard, white tumor the size of a middle-sized orange. This was irregular in shape, and bound the lung firmly to the chest wall. There was no attempt at encapsulation. The rib was involved on the inner surface alone, but was thinned and pushed outward by the tumor. Both lungs were densely studded with secondary nodes, varying in size from that of a marble to that of a plum. These were encapsulated and for the most part quite soft. A number of the larger were quite pulpy. All parts of both lungs were involved. No other organ appeared in any way abnormal.

Microscopic examination showed the tumor to be a round-celled sarcoma.

The injury sustained and the close involvement of the periosteum of the rib in this case allow the suspicion that in reality this was the point of origin. The pleura and adjacent lung were, however, more decidedly involved, and the appearance of the specimen suggested outward extension. In addition, it is more likely that a round-celled sarcoma would spring from the pleura than from the periosteum, though the latter situation is sometimes the seat of this form of new growth.

Finally, we would record a case of unquestionably primary pleural disease of the variety called endothelioma, to the pathological features of which we have already made allusion (see Plate V.). This case did not come under our personal observation, but one of the writers made the autopsy. Our thanks are due to Dr. Alfred Hand for the clinical notes:

CASE IX.—H. S., a German clothier, aged thirty-eight years, was admitted to the German Hospital under the care of Dr. Adam Trau, April 15, 1893. Little was learned regarding his family history, except that one brother died of phthisis.

He had typhoid fever when thirteen years old, but, with the exception of an attack of malaria in 1881, he remained healthy until about eight months before his entrance into the hospital. About that time he began to suffer with pains in the back and a cough. He was not confined to bed, and did not consult a physician. The cough was attended with little expectoration. Physical examination at the time of his admission to the hospital showed the following: The apex-beat of the heart was displaced to the right of the sternum. The right lung was clear. On the left side there was flatness on percussion, absence of fremitus and of the breath-sounds from the base as high as the third rib. Above this there were bronchial breathing and an almost tympanitic percussion-note. For some time after he came under observation severe pain was felt in the region of the left shoulder. There was no elevation of the temperature, and the patient was pallid, though not cachectic.

On May 2 seventy-four ounces of blood-stained serum were drawn off. A half-drachm of this was injected beneath the skin of a rabbit, causing an abscess and death in four weeks, with no other discoverable lesion. Pus from the abscess was examined for tubercle bacilli, with negative result.

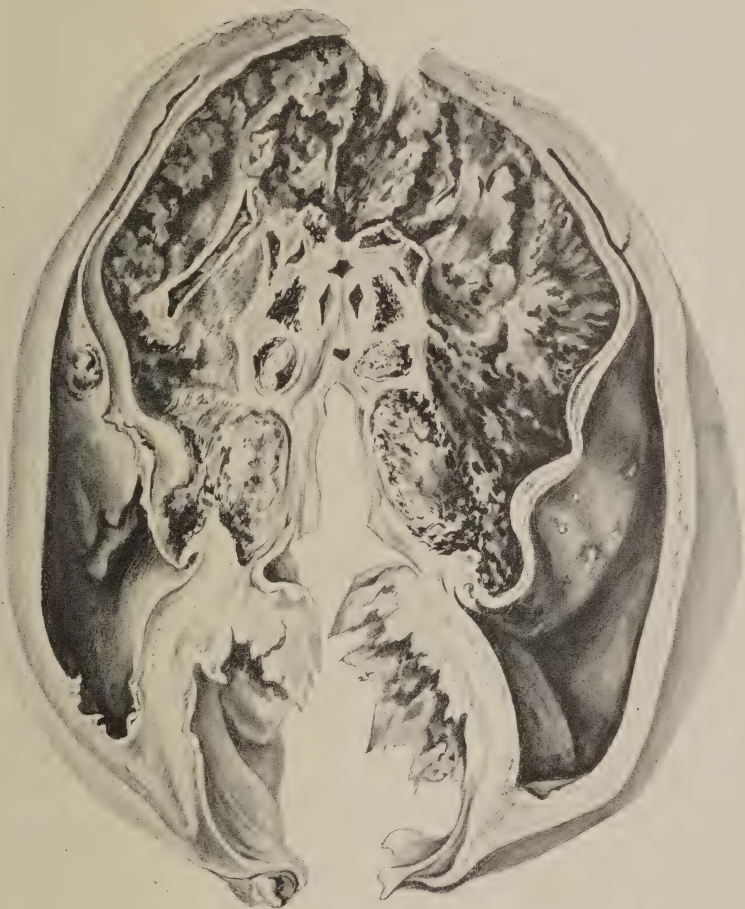
May 3.—There was little change in the physical signs following the aspiration.

May 20.—Eighty ounces of grumous blood and serum were withdrawn. Some of this was injected into the peritoneal cavity of a rabbit, and death occurred a month later. Nothing, excepting some coccidial nodules in the liver, was discovered.

May 24.—The pleural cavity was again filled with fluid, and a drainage-tube was inserted.

June 27.—The case was now transferred to Dr. G. G. Davis, and a rib was resected. Following this the patient's condition grew steadily worse. Violent cough, with

PLATE V.



Endothelioma of left pleura with secondary invasion of the lung. The illustration shows the left lung and pleura laid open by an incision from the apex to the base and from the periphery toward the root of the lung. The pleura is seen to be greatly thickened, especially the diaphragmatic reflection; the lung is compressed and invaded; the pleural cavity is kept open by the rigid walls, and small nodules are visible on the surface of the pulmonary reflection.

slight expectoration, progressive emaciation, and continuously afebrile temperature preceded death, which occurred on July 26.

Autopsy.—The body was wasted to the last degree. In removing the superficial tissues it was found that the left pectoral muscles and the overlying skin were tightly bound together and to the chest wall, and were infiltrated with white nodules. There was some pericardial effusion. The heart was pushed so far to the right that its centre lay under the right border of the sternum. There was a large effusion in the right pleural sac, with strong pleural adhesions. On the left side the pleura was enormously thickened, the costal reflection being in places quite an inch in thickness.

The visceral pleura was almost equally thickened and was everywhere firmly attached to the compressed left lung. The lung itself was infiltrated with numerous whitish-yellow nodules. These were more densely placed near the surface; most sparsely within. The left pleural cavity was distended with liquid similar to that obtained by aspiration. The pleura was very hard and of a glistening whiteness; the inner surface was in some places somewhat irregularly elevated and soft, but this was not the usual condition. For the most part the inner lining was smooth.

The right lung was filled with white nodules. A small nodule was found in the left suprarenal capsule and another in the right kidney; the other organs were unaffected.

The first impression conveyed by the appearance of the pleura was that of chronic inflammatory thickening. Nowhere in this membrane was there a distinct suggestion of nodular or tumorous disease, and only microscopic examination could have revealed the nature of the case. The secondary implication of the lungs, however, showed even to naked-eye examination that there was something more than pleurisy, and the involvement of the chest walls left little doubt that this was of the nature of a new growth. The microscopic examination revealed long columns of cells with more or less perfectly developed or preserved lumina (see Plate VI.). The cells composing these columns were large and of epithelioid character. In many places, as the illustration shows, there was a decided cylindrical character of the limiting cells, while those within presented irregular shapes. The nodules within the lung were similar in appearance, though the acini were not so much elongated. There could be no doubt at all in this case that the pleura was first involved, as the invasion of the right lung was unquestionably secondary, the pleura not being involved at all on that side, and the appearance of the left lung being exactly the same except that the nodules near the periphery merged into the diseased pleura.

Enough has been said regarding the nature of this growth before. It is best designated by the term endothelioma, and we would include it in the group of sarcomata.

DIAGNOSIS.

We may, in conclusion, say a few words regarding the distinctions which may be established between tumors of the mediastinum and aneurism. Essentially, as we said almost at the beginning of this paper, the symptoms are dependent upon the same cause,—viz., pressure; but a careful study of the progress of the symptoms will prove of the greatest service in establishing the diagnosis. Mediastinal tumors are generally infiltrating,

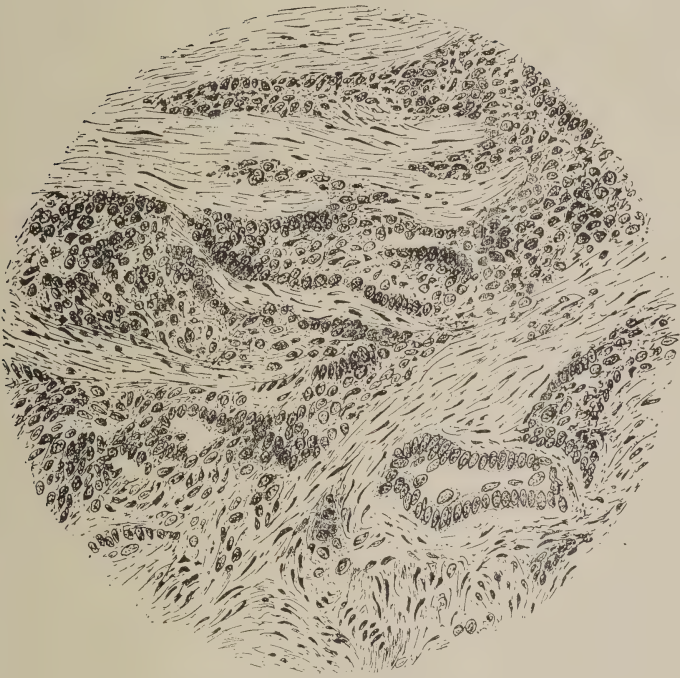
non-capsulated growths which extend in the direction of least resistance, and which, therefore, give rise to much less regular symptoms. Pain is less common and erosion of the bony structures far less frequent. The patient is generally younger than patients with intrathoracic aneurism, and there is usually in the latter some evidence of general arterial disease. Anæmia and emaciation are more pronounced in tumor. Fever is occasionally noted in aneurism, especially when deep-seated, and it may be marked, as in Gairdner's case and in some of our own; but, on the whole, new growths are far more commonly attended with elevations of the temperature. A distinction of the very greatest value in diagnosis is the tendency on the part of intrathoracic tumors, particularly those of the anterior mediastinum, to cause early occlusion of the large veins, giving rise to enlargement of the superficial veins and other signs of venous engorgement. The same thing may occur in aneurism, in the later stages, but even then is infrequent. In the physical examination we are struck by the greater irregularity of the signs in case of tumor. The area of dulness is more irregular; pulsation is less vigorous and almost always distinctly weaker than the pulsation of the heart; the diastolic shock of aneurism is wanting. The auscultatory signs are usually quite different: in tumor there is rarely a systolic bruit, and the second heart-sound does not have the same accentuation as in aneurism. Tracheal tugging is a sign of doubtful value, but is more common in aneurism. Deep-seated tumors and aneurisms are more difficult to distinguish. Pain, however, is less decided in the former, while dyspnoea, stridor, fever, and emaciation are more pronounced. Complicating pleural or pericardial disease would aid powerfully in the diagnosis of the case, as they are far more frequent in cases of tumor.

RÉSUMÉ.

Some of the most important points to which we would again allude are the following:

- (1) The most frequent intrathoracic tumor is sarcoma.
- (2) The most frequent point of origin is the anterior mediastinum, and in particular the remnant of the thymus gland.
- (3) Clinically, these growths may be grouped as those affecting the anterior mediastinum in which physical signs are prominent, those of the middle and posterior mediastinum in which the symptoms predominate over the physical signs, and those beginning in the pleura and in which both symptoms and physical signs are pronounced from the first.
- (4) In the diagnosis the important requisite is a careful consideration of the history of the case from the very beginning, with special attention to the progressive development of the symptoms and physical signs.

PLATE VI.



Microscopic section from case of endothelioma of the pleura.

THE GEOGRAPHICAL DISTRIBUTION OF THE MINERAL SPRINGS OF THE UNITED STATES.¹

BY A. C. PEALE, M.D.,

Washington, D. C.

“WATER cures gout and hypochondriac melancholy ; it benefits gravel and stone in the bladder ; it makes the child grow strong in the womb, and increases the mother’s milk ; it stays hunger, for there was a certain crack-brained man who, at Leyden, when Dr. Carr resided in that university, pretended he could fast as long as Christ did, and it was found that he held out the term of forty days without eating any food, only he drank water and smoked tobacco.” “Water is also of great use to strengthen weak children ; it prevents swelling from bruises, sickness of the stomach, shortness of breath, and vomiting ; it cures fluxes, consumption, flushes, colic, small-pox, etc.”

This, gentlemen, is not a quotation from one of our modern mineral spring circulars, but an extract from a work nearly two hundred years old, entitled “The Curiosities of Common Water, or the Advantages thereof in Curing Cholera, Intemperance, and other Maladies,” by John Smith, C.M. It was reprinted at Boston, Massachusetts, from the London edition of 1712, for Joseph Edwards, at the corner shop on the north side of Town House, in 1725.

Had a map of our mineral springs been prepared when this was written, or when it was republished at Boston, the High Rock Spring of Saratoga, some of the springs at Ballston, New York, the Warm Springs of Virginia, the Sweet Springs of the same State, the Greenbrier White Sulphur Springs, and Berkeley Springs, then called Bath, might have been cited, although none of them was at all improved or used as a resort until the time of the Revolution, or later. Had the map been made in 1831, after Dr. John Bell published his “Baths and Mineral Waters,” the springs named above would not be so few in number, for some fifteen other springs would probably have been added to the number, but nearly all of these would have been in the Appalachian region, mainly in Virginia, New York, and Pennsylvania, with a few in North Carolina and Kentucky, and one in Arkansas,—the celebrated Hot Springs, then known as Washetaw Springs. If we have not made any striking advance in the claims of our mineral water literature, as shown in most of the mineral spring circulars of to-day, we have certainly advanced in the knowledge of the location of our min-

¹ Read at the meeting of the American Climatological Association, at Hot Springs, Virginia, June 14, 1895.

eral springs. I have recently compiled for the United States Geological Survey two maps, one showing the distribution of some three hundred and thirty springs, whose waters are put upon the market to the amount of more than twenty million gallons annually, with a valuation between four and five millions of dollars. Upon the other map I have plotted nearly seven hundred mineral springs which have become resorts.

The map of those springs whose waters are used commercially shows at the first glance that the majority of such springs are found in the Eastern United States and in the Mississippi Valley. West of the one hundred and first meridian they are largely confined to the Pacific coast. In Idaho, Colorado, New Mexico, and Montana we find, altogether, barely a dozen springs so used. This is not because the total number of springs in the East is so much greater than in the West, but it is mainly because the former region has the greater population, and consequently that which is true in many other respects is also true in the matter of mineral waters,—that its resources in that direction are more thoroughly developed and utilized than is the case in the West.

The map of the “Mineral Springs Resorts” presents a much larger total number of springs, and shows also a more equable distribution over the country, for many of our most improved and best known resorts are found in the middle West and in the Rocky Mountain region, and in no respect do they suffer in comparison with those in the East or with those on the Pacific coast. Thus a map giving all the springs would have some plotted within the borders of every State.

Another glance at the map would show that our thermal springs lie mainly in the West. The States west of the one hundred and first meridian include a little more than thirty-nine per cent. of the total area of the country, and yet they contain more than eighty per cent. of its known thermal springs.

The thermal quality of a spring depends largely upon its geological position. Professor W. B. Rogers pointed out many years ago the connection between the warm springs of Virginia and the faults and anticlinal axes of the Appalachian Mountains. In almost every country a connection between thermal springs and mountain ranges is readily recognized, and just as apparent is the connection, the world over, between hot or warm springs and the occurrence of volcanic rocks. In the Rocky Mountain region and other parts of the far West, in addition to the mountainous character of the country, which is of recent origin compared with the Appalachian section, we have also a region of more recent volcanic disturbance, and one in which rocks of igneous or eruptive origin frequently cover extensive areas. As already stated, the hot and warm springs of Virginia and the warm springs of North Carolina and Georgia are found within the limits of the Appalachian folds, and the Arkansas hot springs are found in connection with the Ozark Mountain uplift.

Inasmuch as mineral waters derive their solid constituents from the

rocks through which they pass on their way down and up before they emerge as springs, in this respect also they must be very dependent upon the geological structure of the country. With this in mind, a comparison of the geological map of the United States with a map of its mineral springs is very instructive. In regions where the older or metamorphic rocks constitute the surface formation, or are near to it, as a rule the waters contain a much smaller percentage of mineral matter than in those regions where, in order to reach the surface, the water must pass through sedimentary rocks, which, on account of their structure, are more readily affected by the solvent powers of the water.

It has frequently been stated that thermal waters are less highly mineralized than non-thermal waters. *A priori*, hot water is a better solvent than cold water; therefore if sometimes a thermal water is less highly mineralized, it is probably because it comes from a greater depth, where the rocks are of such a character as to be less readily acted upon. Other things being equal, there is no reason why a thermal water should not contain the same ingredients as a non-thermal water; and, as a matter of fact, where the two occur in the same locality, coming through the same rocks, the difference in quantity is in favor of the thermal water. Here in Virginia, for instance, at the Hot Springs, one of the springs, with a temperature of 78° F., has 18.09 grains per gallon of solid contents, while another, with a temperature of 110° F., has 33.36 grains per gallon; and at the California geysers the coldest spring, with a temperature of 70° F., has 7.12 grains per gallon, and the hottest, at 212° F., contains 296.4 grains per gallon.

So far as the general geological features of the North Atlantic States, including those from Maine to Pennsylvania, are concerned they might be divided into the sections so long recognized in our older school geographies, —viz., the New England and the Middle States. In the former the older rocks form a large part of the surface, which accounts for the fact that, as a rule, the mineral springs of that section are somewhat less highly mineralized than are those of the Middle States. The springs of Maine are slightly alkaline-saline and chalybeate. In Vermont the conditions are much the same, except that sulphuretted springs are more numerous. Connecticut, Rhode Island, and Massachusetts are not remarkable for their mineral springs, though chalybeate springs are common in all. Many of the mineral springs of the New England States are utilized commercially for medical purposes and table-waters, and also as places of resort.

In the Middle States a much larger number of springs is found, and a larger proportion of the waters is utilized, both commercially and as places of resort. Saratoga is the prototype of all other mineral-spring resorts throughout the entire Union. In the Oak Orchard Spring New York has also one of the most celebrated acid springs of the country, while Richfield Springs, Avon Springs, and the Deep Rock Spring are well known far beyond the State limits. In Pennsylvania Bedford Springs is one of the oldest resorts, while Cresson Springs, Gettysburg Katalysine Spring, and many others

are well known. In New York and Pennsylvania, as well as in New Jersey, chalybeate springs outnumber all others. In New Jersey the best-known resort is the Schooley Mountain Spring, a chalybeate spring that has been utilized for many years.

In their geological features the South Atlantic States are not unlike the Middle States, and naturally the springs also are of the same general character. Thermal springs are, however, more numerous, being found not only in Virginia and West Virginia, but also in North Carolina and Georgia, as well as in Florida, where all the springs are slightly thermal and nearly all are sulphuretted. The flow from some of the Florida springs is sufficient in volume to float steamboats of considerable size. Maryland has a fair number of resorts and several well-known waters which are used for commercial purposes. Virginia is, *par excellence*, the mineral-spring State of the section, occupying among the South Atlantic States the same position that New York does in the North Atlantic section; indeed, it is second only to that State in the number of springs that are utilized commercially, and exceeds it in the number of its resorts. The Hot Springs of Virginia are among the most celebrated in the country. West Virginia is equally noted for its springs, having two of the oldest resorts in the United States in Berkeley Springs, at Bath, and the Greenbrier White Sulphur Springs. The general character of the springs in Virginia and West Virginia is the same, saline sulphuretted waters being most numerous, although alkaline, chalybeate, and acid springs are found, both hot and cold. The springs of North Carolina, South Carolina, and Georgia are much like those of the Virginias, and each State has resorts of national as well as local reputation.

The South-Central States include Kentucky, Tennessee, Alabama, Mississippi, Louisiana, Texas, Indian Territory, Arkansas, and Oklahoma. In this section of the country the saline springs outnumber all others, while thermal springs are relatively few. Though a large part of the area is occupied by comparatively recent geological formations, yet in the northern and western portions carboniferous rocks, with the underlying formations, are well developed, and they are usually prolific of mineral waters. Tennessee, Kentucky, Arkansas, and Texas are the important mineral-water States of the section. The Hot Springs of Arkansas occupy a first place among the thermal waters not only of that State, but of the entire country. The springs of Kentucky and Tennessee have had considerable attention paid to them by geologists and chemists, and they have many improved resorts. The Blue Lick Springs are well known. Texas is noted for its springs, among which are a number of acid springs containing free sulphuric acid, and many hot springs in the western part of the State. In Alabama, Mississippi, Louisiana, and Indian Territory there are numerous mineral springs, but apparently they have had little attention paid to them, and we find that fewer have been improved there than in the other States of the section.

The north-central section includes the States from Ohio westward to Missouri and Nebraska, and northward from the Ohio River to the Canadian line. Here the geological conditions are similar to those of the South-Central States, and in both sections saline-chalybeate and calcic waters are abundant, many of them being highly sulphuretted. In Ohio calcic springs probably predominate. The springs of Indiana and Illinois are much the same as those of Ohio. Missouri is a State rich in mineral springs, the Sweet Springs of Saline County being perhaps the best known. The mineral waters of Kansas are drawn mainly from artesian borings, as are those of Michigan also. In both States the waters are well mineralized, sulphuretted saline springs predominating. In the northern part of the north-central section, where there are large areas containing metamorphic surface rocks, the springs are like those of the New England States in their general character, not being as a rule very highly mineralized. The Waukesha springs have a wide-spread reputation, and Wisconsin stands at the head of the list in the number of gallons of water sold from her springs. The springs of Minnesota and Iowa are much like those of Wisconsin, calcic, alkaline, and chalybeate springs being most prominent. The occurrence of acid springs in Iowa is interesting. Dakota has the one thermal spring of the section in the "Dakota Hot Springs" of South Dakota.

The Western States include the Rocky Mountain region and the Pacific coast, with the intervening Great Basin and Plateau region. As already stated, thermal springs are most numerous in this section. California stands at the head so far as the improvement of the springs is concerned, both in respect to the number used as resorts and those whose waters are used commercially. Its mineral waters are of all kinds, and they are not confined to any one section, but are found from one end of the State to the other. With the exception of Wyoming, which includes the Yellowstone National Park, California contains a greater number of mineral springs than any other State.

The Yellowstone Park is, of course, the greatest resort in the United States, and it is deservedly so, not only on account of the presence of its geysers, but also because of the great variety in its springs; when they are better known they will undoubtedly be more highly prized for their medicinal virtues than they are now.

Although there are nearly four thousand springs and one hundred geysers in the National Park, less than one hundred of these springs have had a careful analysis made of their waters. The springs are of course nearly all thermal, and may be classed under three heads,—viz.: (1) calcareous waters, which are generally carbonated to a slight degree, and sometimes are sulphuretted; (2) silicious waters, that are acid, carrying free acid in solution; and (3) alkaline waters, also silicious. Nearly all the springs carry arsenic, varying in quantity from .02 to .25 per cent. of the mineral matter in solution. The waters of one locality in the park are compared

by Mr. Arnold Hague to those of the famous sanitarium of "La Bourboule" in France, which has achieved a wide reputation for the efficacy of its water in nervous diseases.

Colorado, sometimes called the Switzerland of America, has had considerable attention devoted to its springs, and there are now many well-known resorts within the limits of the State, of which perhaps Manitou, near Colorado Springs, is most widely known. A number of the waters are used commercially. Both hot and cold springs are found; many are alkaline, others are chalybeate, and saline springs are numerous. They are sulphuretted and carbonated in many cases.

In Arizona and New Mexico alkaline and saline waters, a large number of them carbonated and sulphuretted, are so numerous that they attract but little attention. They are even more common in some places than springs of pure water. Several springs in New Mexico are utilized for commercial purposes, and Las Vegas Springs is one of the finest mineral-spring resorts in the country. Utah and Idaho both have many well-developed springs. In the former the hot springs at Ogden and at Salt Lake City may be mentioned, and in Idaho, Hailey's Hot Springs and the Soda Springs of Bear River are best known. From the latter comes the Idaho natural mineral water, which is largely sold in the middle West.

Most of Montana's springs are thermal, and they are alkaline, saline, chalybeate, and calcic. Many of them are sulphuretted or carbonated. Among the latter is one closely resembling the celebrated Apollinaris water of Rhenish Prussia. Another spring resembles the Sprudel Spring of Carlsbad. Many of the springs have been improved and are used, to a considerable extent, as resorts. The White Sulphur Springs, Hunter's Hot Springs, and Ferris's Hot Springs are well known locally, while the Broadwater Hot Springs, near Helena, are scarcely excelled anywhere, especially in the matter of improvements. The plunge bath there, connected with one of the hotels, is one of the largest in the world.

Among the Pacific coast States, Oregon comes next to California in the number of its mineral spring resorts, and there are a number of springs both in Oregon and in Washington where the waters are bottled and offered for sale. The State of Washington has the celebrated "Medical Lake," in Spokane County, the waters of which are condensed, and the evaporated salts put up in packages and extensively sold. Lastly, Alaska, whose springs have never been mapped, is a hot-spring territory that has few equals. So far as is known, the springs are generally saline and sulphuretted.

The practical point in this *résumé* of our mineral springs is that, within our own borders, we have springs that duplicate those of Europe, or, indeed, of any other part of the world, and we have them at all elevations, from that of the Atlantic or Pacific coast to the high mountain areas of Colorado, the apex of our country, where the mountain peaks were above the water as islands while the rest of the country was beneath the seas.

We have springs also under all climatic conditions, from the equable climate of Southern California to the glacier-bound regions of Alaska, and from the sunny skies of Florida to the bracing air of New England.

THE TREATMENT OF DIPHTHERIA WITH DIPHTHERIA ANTITOXIN.¹

BY EDWIN ROSENTHAL, M.D.,

Philadelphia.

LÖFFLER was the first to isolate and cultivate the micro-organism of diphtheria, which had been previously discovered by Klebs, and which now is known as the Klebs-Löffler bacillus.

Löffler, Roux, Yersin, and Sydney Martin have investigated diphtheria, and their experiments have proved that it is not the mere presence of the bacilli that gives rise to all the symptoms which we meet, but that the products, the ptomaines or poisonous substances, attending their growth and multiplication are responsible. Roux and Yersin substantiated their theory by separating the bacillus from the ptomaines and by subjecting the latter to chemical examination and physiological tests. These observers described the disease as a toxæmia differing from other toxæmias in this respect, that the toxin acts as a ferment, which, when injected into living tissues, even in the most minute quantities, produces certain well-defined albuminous bodies. These bodies were subjected to chemical tests by Sydney Martin and resolved themselves into proto-albumose and dextro-albumose. Further studies and experiments upon these substances by Breiger, Fränkel, Proskauer, Wasserman, Roux, and Behring led to a knowledge of immunization. The toxins, as well as the antitoxins, have been shown by Buchner to be probably the direct products of bacterial cells.

The immunity of individuals against disease is understood to depend upon the destruction, by certain agents, of the supposed living cause of the disease. These agents may also act by hindering the growth of the living cause or by destroying its infectious properties through the neutralization of poisonous materials produced in the infected organism or by imparting a higher resisting power to the economy against this poisonous substance. Behring's serum-therapy is based upon these ideas and depends upon his own discovery of the fact that we are able, by the subcutaneous injection of the blood of animals which are rendered immune from the action of certain bacteria, to render other animals immune from the inoculation of the same

¹ Abstract of a paper read before the Philadelphia County Medical Society, September 11, 1895.

bacteria. Not only does such an injection (*impfung*) protect the animal against living bacteria, but also against their toxins. This fact has also been pointed out by Behring and Kitasato in connection with the tetanus bacillus and tetano-toxin. Formerly, in producing immunity a disease was set up which would protect from a more violent disease. Now, by Behring's method, a substance is injected into the blood which is harmless in itself, but which protects the individual from infection, and from the results of bacterial growth, if he be already infected. The substance which produces this result is known as antitoxin.

In order to obtain an antitoxin which may be used to combat diphtheria, it is necessary to render certain animals immune from the disease by the injection of minute but gradually increasing amounts of diphtheria toxin, which is obtained by the cultivation of the diphtheria bacillus in nutrient broth.¹ The blood of animals thus treated contains the antitoxin. Diphtheria antitoxin, as prepared by Dr. Joseph McFarland, who employs the Roux method, has been described in an article entitled, "Preparation of the Diphtheria Antitoxin," which was published in the INTERNATIONAL MEDICAL MAGAZINE, vol. iv., No. 3, p. 194.

The requirements of the serum obtained by Roux's method, to make it equal to the accepted standard, is that one part shall protect against ten times as many parts of a standard toxin. Thus, if one-tenth cubic centimetre of toxin will kill a five-hundred-gramme guinea-pig, one-hundredth cubic centimetre of the antitoxic serum should cause the animal to recover from the effects of such a dose. Serum thus obtained may be kept for some time before using, provided it is kept sterile by the addition of some antiseptic, such as carbolic acid, trikresol, or camphor. The serum does not retain its power indefinitely, however, but gradually grows weaker.

The antitoxic serum is used as a curative or immunizing agent by subcutaneous injection into the tissues of the body. The sites most frequently selected for making the injection are the back between the scapulæ, the loins, groins, or sides of the chest. The parts should be thoroughly cleaned before the injection is made, and the hypodermic needle puncture should be hermetically sealed by iodoform and collodion after the operation is completed. The amount of antitoxin used depends upon the time of making the injection, the age and body weight of the individual, the gravity of the disease, and upon whether the injection is made for the purpose of immunization or for cure. In the first two days of the disease, if the case be one of average severity, I give an injection equivalent to six hundred antitoxin normals. If the case be seen on the third day, or if at the beginning the infection be such that I believe in the necessity for prompt treatment, as in laryngeal cases or when the lymphatics are involved, I immediately inject ten cubic centimetres, or one thousand antitoxin normals. If within six, twelve, or even twenty-four hours no change takes place, or if the symptoms are ag-

¹ Blutserumtherapie und Geschichte der Diphtherie, Behring.

gravated, I again inject one thousand antitoxic normals of serum, and continue in this way until a decline of the pulse-rate, a lower temperature, and an improvement in the general condition show that there is an amelioration of the symptoms. I have noticed another sign which is manifested in from six to twelve hours, even before the pulse and fever decline, which indicates that I have used sufficient antitoxin; this sign is the appearance of a blood-red line surrounding the diphtheritic patches in the throat. This line is very distinct and shows the demarcation between the healthy and infected mucous membrane. When this line is visible, my experience has taught me to expect a very favorable result in the particular case. The quantity of antitoxin administered may be increased to enormous dosage, and, being harmless, no danger need be apprehended. My own statistics show that two thousand antitoxic normals were sufficient in the most serious cases. The question might arise, What is an antitoxic normal? An antitoxic normal, or an immunity unit, is an amount of antitoxic serum required to save a five-hundred-gramme guinea-pig from the minimum fatal dose of diphtheritic toxin. I use, as an immunizing dose, an injection of one hundred antitoxic normals to perfectly healthy individuals who have been exposed to the contagion of diphtheria.

The question now arises, Is diphtheria antitoxic serum a cure for diphtheria? For diphtheria pure and simple, where no other infection exists, I am prepared to say, yes. Where, however, other infection exists, which is manifested by other symptoms, demonstrated by other indications, and proved by bacteriological examination, I must modify this reply, and, though my success and statistics have been extraordinary, I think it only proper and truthful to say that this is due to a recognition of the other complications and a prompt and careful specific treatment of the same. It is therefore a very rational explanation of the brilliant results which the early use of antitoxin has given. When used before the diphtheria toxins have so invaded the tissues as to destroy them, antitoxin is a specific. Where the complex symptoms are such that life cannot exist (the degenerations of muscles and nerves or the toxæmia or septicæmia), this or any other method of treatment cannot cure. Understanding diphtheria with all the complications that may arise, I modify the treatment and pursue the following method:

After injection of the serum, whether the case was one requiring intubation or not, whatever the variety may be, I immediately ordered a purgative to rid the alimentary canal of any infectious bacilli. For this purpose I give calomel hourly, combining it with salol in suitable dosage, until characteristic evacuations occur. At the same time I administer a judicious amount of stimulants and food. If any complication exists which by its presence endangers life, I administer the antitoxin, but pay no more attention to the diphtheria except to stimulate the patient and to treat the symptoms. For example, if the complication be pneumonia, my whole energy is directed to the lungs, or if it be a nephritis my whole treatment

is directed towards the kidneys. That this is the correct method my statistics, showing recovery of such cases, will prove. In a case of pneumonia in the practice of Dr. Metzler our treatment was mainly directed to the lung infection, and the result was a cure. The same incident was noted in the practice of Dr. H. H. Freund. In a case of acute tubal nephritis seen by Dr. Van Gasken no other remedial agents were employed but those commonly used in such affections. I can therefore safely assert that, while antitoxin is a specific in diphtheria, it is not a cure-all, and, if reliance be placed on this remedy alone, disappointment will be the rule instead of the exception.

That diphtheria antitoxic serum has curative virtues none who understand the clinical manifestations of the disease should deny. Still, there are many who by word and pen decry its virtues and give to it credit for nothing, and who even go so far as to assign to it downright harm. In order to combat these assertions I prepared a list of questions containing the points upon which the antagonists of antitoxin lay particular stress. These questions have been sent to physicians who have used the serum and to hospitals in different cities. The questions I most desired answered were those upon which the antagonists of the serum-therapy laid the most stress. They were the frequency of skin eruptions, joint pains and swelling, renal complications, sequelæ, and the true protective value of immunization.

The question of diphtheria coming as a complication of, as an addition to, or following on scarlatina or measles was particularly interesting to me, as, in my opinion, such cases are the most serious if not the most fatal. In my experience, diphtheria of the larynx (membranous croup) following measles was always fatal under other methods of treatment.

Dr. W. E. Johnson, of Waverly, New York, treated four cases with the diphtheria antitoxin. All four recovered. No bacteriological examinations were made. Six thousand immunity units, sixty cubic centimetres, were administered to a case, aged fifty-six, and two thousand immunity units, twenty cubic centimetres, were administered to each of the other cases. The case aged fifty-six showed joint pains followed by paralysis. One case showed albumin after the injection.

Dr. C. P. Adams, of Trenton, New Jersey, treated two cases with the antitoxin. There were no deaths; but there had been a death in the family previous to the use of the serum. No bacteriological examinations were made. The membranes disappeared on the third day. The pulse and fever declined in from twenty-four to thirty-six hours. There was adenitis in both cases. The injections were made on the second day.

Dr. I. R. Schoonmaker, of Sayre, Pennsylvania, treated two cases. Both cases recovered. No bacteriological examinations. One of the cases was in an adult who received, on the second day, two thousand immunity units twice injected, making four thousand immunity units. The other case was in a child who received two thousand immunity units in two injections. There had been a death in the family previous to the use of the serum.

The membrane disappeared from the child's throat on the third day and from the adult's on the fifth day. The pulse and temperature declined in twenty-four hours. The child presented an erythematous eruption. No complications or sequelæ.

Dr. J. N. Richards, of Fallsington, Pennsylvania, treated a case which recovered. There was no bacteriological examination. The injections were made on the third and fifth days, one thousand immunity units being given at each injection. The membrane began to disappear in from twenty-four to forty-eight hours, and was gone on the third day. The pulse, respiration, and temperature declined in six hours after the second injection. No complications or sequelæ.

Dr. W. S. Long, of Haddonfield, New Jersey, treated three cases which recovered. No bacteriological examination was made. The injections were made in one case on the third day, in another on the fourth, and in the third on the second day of the disease. The membranes disappeared on the fourteenth, seventh, and second days respectively. Urticaria was noticed in the first case, and some paralysis was observed in the first and second cases. Immunization was practised on the third case, in which five hundred immunity units were given. The third week after the injection visual traces of the disease were manifested, and fifteen hundred immunity units were administered.

Dr. A. F. Hyde, of Shelby, Ohio, treated seven cases, with one death. Bacteriological examination was made in one case. The membranes began to disappear in from twenty-four to forty-eight hours after the injection, and in three days they were entirely gone. All these cases suffered from adenitis. In one case pneumonia complicated the diphtheria. As sequelæ, three cases suffered from paralysis. Immunization was practised once, three hundred units being given, and was successful. The fatal case was septic and moribund, dying seven hours after the injection.¹

Dr. S. I. Bassford, of Biddeford, Maine, treated three cases, with one recovery and two deaths. No bacteriological examinations were made. The first case was injected on the second day of the disease and died of catarrhal pneumonia on the twenty-seventh day after the injection. The second case was cured, and the membranes disappeared in forty-eight hours. The third case died in twenty-four hours of sepsis. The first case developed as a sequel of scarlet fever.

Dr. Wm. McD. Struble, of Trenton, New Jersey, treated eleven cases, with one death from asphyxia. No bacteriological examinations were made. Seven cases were injected on the first day of the disease, two on the second day, and one on the fifth day; each case received one thousand immunity units. The membrane disappeared on the third day after the injections in five cases, on the fourth day after the injections in two cases, on the fifth

¹ Three of these cases were reported in the Columbus Medical Journal, April 30, 1895.

day after the injections in two cases, and on the sixth day after the injections in one case. A decline in pulse and temperature was noticed in from six to forty-eight hours after injection. A slight erythema was noted in half the cases. All cases had enlarged glands, but no suppuration. In two cases albumin was found. Dr. Struble used antitoxin on five cases, with one death; the case could not have recovered under any plan of treatment. He then treated a second series of five cases without antitoxin, and of these two died. A third series of five cases was then treated with antitoxin, and all recovered. The first two cases of a fourth series were so severe that he used the antitoxin, instead of the old method, as he had at first intended, and both recovered.

Dr. G. Metzler treated one case in which no bacteriological examination was made, and which recovered. Five hundred immunity units were injected on the third day of the disease, and the fever and pulse-rate were moderated within twenty-four hours. The membrane had disappeared in three days. Dr. Metzler practised immunization in eleven cases, using one hundred and fifty immunizing units in each case. No diphtheria appeared in any case.

Drs. Eugene F. and Louis Hauck, of St. Louis, Missouri, treated eighteen cases, with two deaths. Bacteriological examination was made in each case. The injections were made on the second day of the disease in six cases, on the third day of the disease in six cases, on the fourth day of the disease in four cases, and on the sixth day of the disease in two cases. Six cases involved the larynx, and five were intubated, with two deaths after intubation. The membranes disappeared in two days in six cases, in four days in six cases, and in five days in four cases. The throat was free from bacteria only after three weeks. The temperature and pulse declined after twelve hours in the majority of cases, in some as early as three hours after the injection. Joint-pains were noticed once. Paralysis appeared as a sequel in three cases. Diphtheria occurred as a sequel to scarlatina once, with recovery. Immunization was practised on two adults and two children with successful results.

Dr. S. J. Ottinger, of Philadelphia, treated one case which died. The case was one in which the membrane involved the larynx, fauces, and nares, and was septic when injected with one thousand immunity units on the seventh day. The dose was repeated in six hours, but the child died fifteen hours after the first injection. There was a decline in pulse, respiration, and temperature four hours after the second injection. Death was caused by paralysis of the heart.

Dr. G. E. Roos, of Scranton, Pennsylvania, treated twenty-five cases, with one death. No bacteriological examination was made. The injections were all made between the first and fourth days, and from one thousand to two thousand units were used. In the case that died the membrane was in the larynx, and the patient had been intubated; death occurred from suffocation due to membrane below the tube. The membranes began to disap-

pear in from twenty-four to forty-eight hours, and the throat was free in from two to eight days. Pulse, temperature, and respiration declined in twenty-four hours after the injection. One case had pneumonia before the injection.

Dr. Alexander Klein, of Philadelphia, treated two cases which recovered. The injections were made on the second and fourth days respectively, and the throats were clear of membrane on the fourth and third days after the injection respectively. Bacteriological examination was made and the bacilli were not found in one month and five weeks respectively. Temperature and pulse declined in twenty-four hours. One case showed an eruption, and the other showed joint-pains. Immunization was practised in eleven cases, all of whom remained well.

Dr. Samuel P. Gerhard, of Philadelphia, treated five cases, all of which recovered. Bacteriological examinations were made in all cases. One case received fourteen hundred immunity units, the others one thousand units each. The injections were made on first, third, second, and fifth days. The throat was free from membrane on the fifth day after the injection in all cases, and from bacilli in from three to ten days. The temperature and pulse began to decline in six hours after the injection. A skin eruption was noted in one case after and in another before the injection. Adenitis occurred in three cases before the injection. Anuria with œdema was seen in one case after injection, due to exposure. Two cases had paralysis as a sequel. One case was immunized successfully.

Dr. H. H. Freund, of Philadelphia, treated four cases with one death. All the cases were laryngeal, and two were intubated, death occurring in one of the cases intubated from œdema of the lungs. In the favorable cases the membrane was gone on the fifth day. A decline in pulse, respiration, and temperature was noted within forty-eight hours. One case had pneumonia.¹

Dr. Charles D. Spivak, of Philadelphia, treated four cases, all of which recovered. No bacteriological examinations were made. A laryngeal case was intubated several hours before the injection, the membrane disappeared from the fauces in five days, and the tube was left out in sixteen days. Temperature, pulse, and respiration declined in from six to eight hours. One case, which developed as a sequel to measles, had adenitis.

Dr. J. J. Owen, of Philadelphia, treated two cases, with one death. The fatal case was a laryngeal case that had been intubated. The case which recovered required two injections amounting to seventeen hundred units. The temperature and pulse declined in four hours after each injection.

Dr. George A. Muehleck, of Philadelphia, treated twenty-six cases with three deaths. Bacteriological examinations were made in all cases. Forty cases were immunized, all were children, and in one-half the Klebs-Löffler

¹ Reported in the Medical News.

bacillus was found. No case showed visible signs of the disease. In the cases that died the injections were made a few hours before death. In the successful cases the membranes began to disappear in the faucial and palatal cases in from twenty-four to thirty-six hours, in the laryngeal cases in from forty-eight to seventy-two hours. The throat cleared in from five to six days in the faucial and in from seven to ten days in the laryngeal cases. Bacteria were absent in from four to five weeks. The temperature, pulse, and respiration declined within four or six hours. Albumin was found in twelve cases. Paralytic symptoms appeared as a sequel in twelve cases; but disappeared very soon. Three cases developed as a sequel of measles, one of these died.¹

I have now had under treatment with the antitoxin seventy-eight cases, with two deaths. Both fatal cases had been intubated. Bacteriological examinations were made in the majority of the cases. One thousand immunity units were given at a dose, repeated in from twelve to twenty-four hours if necessary. No joint-pains were noticed. A skin rash appeared in ten cases. Albumin was detected in eight cases and had nothing to do with the administration of the serum. Two hundred cases were immunized, receiving from one hundred to two hundred units as an immunizing dose. Fifty per cent. of these showed Klebs-Löffler bacilli; but not one showed a visible trace of the disease, even when constantly brought in contact with patients suffering from the disease. The patients showed no bad symptoms on receiving this dose. A pregnant woman, late in the course of gestation, received six hundred units as an immunizing dose. Phthisical patients and those suffering from other diseases were immunized successfully. The injections were made from the first to the seventh day of the disease. In the faucial cases the membranes began to disappear on the second day and were entirely gone by the fifth day. In the laryngeal cases stenosis was relieved on the third day; while in those cases intubated the tube was allowed to remain until the fourth day. Bacteriological examination showed the bacilli one month after the injection. Anæmia or other sequelæ were never noticed.

Dr. L. Wolff, of Philadelphia, treated five cases, all of which recovered. Bacteriological examinations were made. One thousand units were injected on the second and third days of the disease. Immunization was practised once successfully. The throat was clear in three or four days. No skin eruption or joint-pains were noted. Adenitis was a symptom. Albuminuria was noted twice. One case was followed by paralysis.²

Dr. John Sebastian Miller, of Philadelphia, reported eighteen cases, with recovery in all. Eight cases were successfully immunized. Bacteriological examinations were made in twelve instances. The injections were made on

¹ Four cases reported in the Medical News; also paper read before the College of Physicians and Surgeons.

² One case published in the Medical News.

the first, second, and third days. Stenosis of laryngeal cases was relieved in three days. Four cases had adenitis, and albuminuria was noted once. Five laryngeal cases had aphonia as a sequel, lasting one week. Dr. Miller says, "I have not lost a single case since the antitoxin period, and the majority of my cases were very seriously ill; a death now in my practice would be an exception. Before the antitoxin period I looked upon diphtheria with a great deal of fear, and death was a common occurrence. Despite intubation and tracheotomy, my percentage of deaths was always large. My cases are always serious, and I can find no difference in the gravity except that they recover."

A summary of these reports shows that two hundred and twenty-two cases were treated with antitoxin, with thirteen deaths, a mortality of five and nineteen-twentieths per cent. Twelve of the deaths were in laryngeal cases. Skin eruption occurred in thirty-two cases, joint-pains in three cases, and adenitis in fourteen cases. Albuminuria was seen in twenty-four cases before injection and two cases after injection, anuria in one case after injection; there was no nephritis. As sequelæ, paralysis occurred in sixteen cases, including twelve cases of aphonia. These results are surely not a contra-indication to the further use and observation of this treatment.

There were two hundred and seventy-six cases immunized. One case is reported by Dr. W. S. Long, of Haddonfield, New Jersey, as becoming infected three weeks afterwards. Two hundred and one cases showed bacilli on bacteriological examination.

In conclusion I would say that clinical evidence is in favor of antitoxin, notwithstanding the contrary opinions expressed. For the different monographs upon this subject I am very much indebted to my cousin, Dr. A. Baer, of Berlin, who has also furnished me with my Behring's antitoxin. I am also under obligations to Dr. Roger S. Tracy, of the New York Board of Health, and Dr. S. H. Durgin, of the Boston Board of Health, for their kindness in furnishing me with statistics; also to Dr. Page, of the Boston City Hospital, for his statistics.

CLINICAL LECTURES.

*NEURASTHENIA.*¹

LECTURE IN THE DEPARTMENT OF THEORY AND PRACTICE, INTRODUCTORY TO THE
SEVENTY-SEVENTH ANNUAL SESSION OF THE MEDICAL COLLEGE OF OHIO.

BY JAMES T. WHITTAKER, M.D., LL.D.

GENTLEMEN,—In accordance with my usual custom, I shall occupy this hour with some remarks concerning the disease which is most prominently before the profession at this time. For several years we had to talk about tuberculosis; once about typhlitis; last year about diphtheria; this year I invite your attention to the study of neurasthenia.

You are not to infer, however, that neurasthenia is a new disease, any more than were tuberculosis, typhlitis, and diphtheria. It is simply that the accumulation of new facts surrounds these affections with unusual interest. Neurasthenia was always known. It was always appreciated that certain individuals have weak nerves, just as others have weak eyes, weak lungs, weak stomachs, etc. But the weakness of the nervous system was not set apart and studied as a separate affection until our own day. As we look back over the history of medicine, those of us who are older, we recognize neurasthenia under other names. Thus, the condition was always confounded with hysteria and hypochondriasis, diseases which are as old as antiquity itself. A large contingent of the cases of so-called spinal irritation we know now to belong to this affection. Neurasthenia often masqueraded under different faces. As we look back we may now see that most of the cases of spermatorrhœa and a right respectable majority of the cases of impotency belong to neurasthenia. That "tired feeling" which was likely known to our ancestors as far back as the most ardent Darwinian can trace is often an expression of neurasthenia.

Neurasthenia, as we now know it, is a disease first recognized in our own country. It was Beard, of New York, who, in 1880, first set apart and distinguished as a separate affection that irritable weakness which distinguishes it and which he very properly named neurasthenia. European writers paid little attention to this distinction at first, but with their idea of the way in which affairs were supposed to be conducted in this country

¹ Abstracted by S. Malsbary, Reporter.

were quite willing to admit the existence of such a disease with us. They spoke of it rather superciliously at first as an American disease. When they opened their eyes a little wider they saw it all around them, and now it is known that neurasthenia is as common everywhere in Europe as with us. It must be confessed that neurasthenia did not quite get the proper recognition at first in the land of its birth. "The prophet is not without honor save in his own country." The term was used derisively, and the reflection was made of sensational attempts at notoriety in nosology. But the truth always prevails in time. After a while it was seen that neurasthenia had a distinct symptomatology which could be covered in under the name of no other disease. Hereupon there was a reaction to the other extreme, and the term came into such general use as to be a kind of mantle for all unknown maladies of a nervous character. Hence there was much abuse of neurasthenia, and the diagnosis of this condition was often established in cases of much more serious organic diseases, as of beginning tabes or dementia, or, indeed, of diseases of very different character, tuberculosis, carcinoma, diabetes, Addison's disease, etc. But time sifts out all errors, and now, in our day, neurasthenia stands apart with a symptomatology whose lines may be distinctly drawn.

The fact is that neurasthenia is the most common of all the nervous diseases. You will be surprised to hear the claim of the best neurologists, that neurasthenia constitutes fifty per cent. of the diseases of the nervous system. It is this knowledge of the nature of the affection and of its great and increasing frequency which gives neurasthenia its present prominence.

Neurasthenia belongs to all ages, to both sexes, and to every walk of life. In regard to sex it differs essentially from hysteria, which affects chiefly women, and from hypochondriasis, which affects chiefly men. Neurasthenia is encountered in every period of life,—from five to seventy-five. Hysteria is more common in earlier life, and hypochondriasis in later life.

In the study of etiology the first attention, as in the case of all the neuroses, must be directed to heredity. The influence of heredity is strong, but not so strong as in the case of hysteria, epilepsy, insanity, and other diseases of the nervous system. Neurasthenia is, of course, never inherited. It is the neuropathic tendency which is transmitted,—that is, the weak nerve-cells whose nutrition is easily disturbed, whose energy is rapidly and readily exhausted. Individuals who come of neuropathic stock, whose ancestors have suffered from insanity, epilepsy, migraine, alcoholism, become easy victims of neurasthenia.

But the condition is more frequently acquired, and most cases owe their origin not to bad inheritance but to bad habits. In early life faulty education plays an important rôle. Men who are engrossed in business and women who are absorbed in society have no time for the training of children, who are turned over to nurses, governesses, etc. In lower life poverty affords a

better excuse for neglect. Among the upper classes the nervous system is exhausted by over-stimulation. Children are allowed to attend theatres, balls, parties, are over-stimulated at school, may be forced to attend during existence of headache, fever, or are allowed to stimulate the nervous system with coffee, tea, some even with alcoholic drinks. What chance has such a child in the struggle for life?

In later life men become exhausted with business cares, the demands of trade, the aggregation of capital, to the exclusion of the small holder, the terrible competition of rivalry; women strain the nervous system in the sacrifice to sustain appearances, the social agonies. It is, therefore, not so much work as worry that does the damage. The steady, plodding, contented, cheerful men and women who do the real work of the world do not suffer. Times of financial depression and panic, disappointment in love affairs, domestic infelicities, discontent, exhaust the nervous system. Then the individual tries to keep up by appeal to stimulants. He takes to drink and he forces sleep with hypnotics. Cases of neurasthenia accumulate in student life towards the end of the term under the process of cramming for examination, when the brain is stimulated to unwonted effort by tobacco, coffee, and alcohol. The abuse of these stimulants simply in self-indulgence leads to the same result. Sexual excesses play an important rôle. Especially do the unnatural perversions of this relation exhaust the nervous system. Finally, in a few cases, the exhaustion may be the result of real disease. Neurasthenia develops occasionally after typhoid fever, perhaps more frequently after influenza. Trauma is responsible for a few cases.

Neurasthenia has a varied but nevertheless distinct symptomatology. We say of hysteria sometimes that it is Protean in its manifestations, and of neurasthenia that it is a real box of Pandora in the variety of its signs. As the name implies, neurasthenia is a nervous weakness, but the weakness is of peculiar character: it is the irritable weakness which stamps the neurasthenia. The emotional nature is affected first and most. The neurasthenic patient loses his interest in life; he becomes selfish, like a hypochondriac, but, unlike an hysterical patient, he is not easily affected by outside influences. The subject of neurasthenia is occupied with his own internal distress. He is in a state of more or less constant excitement, a kind of suppressed excitement which is difficult to describe in words, but may be best expressed under the term anxiety.

The subject of neurasthenia suffers unspeakable anxieties. He is the victim of a thousand fears. The field of philology has been ransacked to describe the apprehensions of neurasthenia. The fear of place is a common form. There are individuals who cannot cross an open space alone. This is the well-known and first described agoraphobia. On the other hand, there are individuals who cannot remain in closed places. This fear is the claustrophobia. I have a patient at the present time who is unable to attend the theatre and who finds it impossible to remain in a street-car. This patient, a highly intelligent, sensitive woman, must sometimes walk

for miles, until she is faint, because she dare not enter a car. These things are not feigned. If you force a neurasthenic patient into such a position the evidence of suffering becomes manifest in the symptoms of depression, sometimes in a cold sweat which breaks out upon the face, sometimes in an outcry which violates proprieties. A more common condition and expression of a lighter form of the disease is a monophobia, in which the individual fears to be alone. Such an individual requires the presence of another person in the room or sometimes even in a carriage, and as to sleeping in a room alone it is entirely out of the question. Then there are individuals who fear the dark, nyctophobia; others who fear storms: I suppose every one here knows of some individual who is afraid of lightning and must darken the room during the prevalence of a thunderstorm. There are individuals also who have a terror of travel, especially upon railroad trains, and who cannot sleep at night on account of the constant apprehension of an accident. The fear of lightning has been characterized as a siderophobia, and of railroad travel as siderodromophobia. Then there is the zoophobia, the fear of animals, the well-known lyssophobia, the fear of hydrophobia, the still better known syphilophobia, and the fear of any disease, nosophobia. There is the fear of man, anthropophobia, the fear of certain definite places, topophobia, the fear of filth, mysophobia. I knew once the case of a lady in this city who covered all her furniture every day with fresh linen, and who slept in kid gloves on account of the fear of contamination. Finally, there is the fear of everything, pantophobia, which is pretty close to insanity. Every gradation of anxiety is offered in these conditions, some of which, like the fear of solitude or fear of the dark, are close up to the line of health. There is every gradation, from the child who is afraid to go to bed in the dark and the old man "who cannot look down from that which is high" (acrophobia) to the individual who is on the verge of insanity. There is every gradation between mere nervousness and neurasthenia. I believe it is in Ecclesiastes that mention is made of the fear of height. It is said that a man cannot look down from that which is high. This is a weakness, the timidity of muscle, which meets an expression also in the peculiar fears of the beginner with the bicycle. All fear is weakness. Stage fright is a temporary neurasthenia. Pantophobia represents the other extreme.

The mind suffers but not to the same degree. The intellect suffers from disuse. It is impossible to concentrate the mind; the very attempt to do so increases the feeling of exhaustion and irritation. The resource of books is lost, the individual may force himself to read line after line and page after page, but without any comprehension of what he has read. Finally, the page presents only a blurred image. All spontaneity is lost. The neurasthenic patient gives out nothing. He loses interest in life. One of the ladies upon whom devolved the duty of entertaining one of the French kings, who had exhausted himself in the round of dissipation, said that it was given to her to amuse the king, who had become *inamusable*.

Scheherezade, who told the story of the Arabian Nights, to save her own neck, could not divert a subject of neurasthenia.

The special senses are not so much affected. Sometimes there are sparks before the eyes, *muscæ volitantes*; sometimes there are noises in the ears, *tinnitus aurium*, but as a rule the special senses are but little disturbed.

It is different with the power of motion. All the muscles are weak. The weakness is expressed first in tremor, which is one of the cardinal signs of neurasthenia. It is a fine tremulous movement, like the vibrations of alcoholism or lead-poisoning, which distinguishes neurasthenia. The patient becomes actually incapable of effort, and sits or lies disinclined to move. The idea of undertaking anything increases the distress. The reflexes are affected in the same way,—that is, they show the stage of irritable weakness. The knee-jerk is rather increased and the muscle and cutaneous reflexes respond too readily.

There is great disturbance in the sensory sphere and rather in the direction of hyperæsthesia than anæsthesia. Every patient complains of some local distress, coldness or heat, numbness, formication, tingling, some form of paræsthesia.

Another one of the cardinal signs is the disturbance in the sphere of the vasomotor system. The face is pale and flushes easily. Sometimes there is pallor on one side and flushing on the other, or rapid alternation of the two conditions. The surface is cool and dry; on exposure to cold the face and hands easily become blue. The patient complains of icy-cold feet.

Insomnia is one of the great distresses of neurasthenia, and is another expression of that irritable weakness which characterizes the condition. Sometimes the patient is unable to fall asleep. He resorts in vain to all the tricks and devices recommended. In other cases he awakens from the first sleep and is unable to sleep again, and so rises exhausted in the morning. Many patients will maintain that they do not sleep a wink all night. Of course this is not true, but it is true that the little sleep they do get is light, and that they awaken so easily from the slightest noise as to seem not to have been asleep.

There is great distress in the genital sphere. Some of the cases have been produced by excesses, more by masturbation, and the irritable weakness itself produces a kind of excitement which finds gratification in protracted and unnatural means. Thus is established a *circulus vitiosus*. There is often a veritable spermatorrhœa. It is not true that most of these cases are simply prostatorrhœa. There is often a parietic condition of the seminal vesicles and a discharge of real spermatozooids. Thus habits of masturbation may produce neurasthenia, and neurasthenia begets spermatorrhœa and intensifies the habit. Most of the sexual perverts are victims of neurasthenia.

Now, the form of neurasthenia may vary. Sometimes the weakness is found chiefly in the brain to constitute the cerebrastrhenia. Sometimes it

is in the stomach, gastrasthenia. The great majority of cases of nervous dyspepsia belong to neurasthenia. There is a distinct neurasthenia of the heart, neurasthenia cordis, which expresses itself in the same irritable weakness; the pulse is quick and excitable, any effort increases the frequency of its beats. A sudden knock at the door excites an attack of palpitation; a mere state of expectancy increases the pulse. In still other cases the main expression is in the genito-urinary sphere. The bladder is sluggish; the genital sense is exhausted; the individual is impotent, and the idea of impotency intensely aggravates the neurasthenia.

So you see it is a pretty distinct picture which is offered by this disease, and, while the symptomatology is enormously varied, there are certain cardinal signs which distinguish the affection. There is the state of anxiety which is characteristic. There is the intense preoccupation of mind with his own affairs, a lack of interest in all matters outside of himself. Then there is the heightening of the reflexes, the vasomotor disturbance, pallor and flushing, the tremor, palpitation, and genital disturbance, which make an array of unmistakable symptoms.

Hysteria is a lack of control of the will. The neurasthenic patient may have a strong will. Hysteria has its emotional dramas, peculiar sensory disturbances, globus, clonus, hemianæsthesia, which are unknown in neurasthenia, except in so far as the one affection may be complicated with the other.

Hypochondriasis is the concentration of the mind upon the internal organs. Some hypochondriasis belongs to neurasthenia. All neurasthenic patients are depressed,—as the Germans say, *verstimmt*,—but there is never that intense concentration of mind upon an individual organ, which is so characteristic of hypochondriasis, in neurasthenia. Moreover, the hypochondriac is not weak; on the contrary, he may be very strong. He may make his mind work, and do good work, in the short intervals of time which are not occupied in the expression of his own distresses.

Neurasthenia is such a convenient term that, like malaria, it has been used to cover a multitude of affections. It is an easy cloak to other very difficult diseases; so the diagnosis should be reached by exclusion, and in all cases organic affections must be ruled out. The study of the case will necessitate, therefore, the consideration of tuberculosis, carcinoma, Bright's disease, diabetes, Addison's disease, lead-poisoning, as well as certain organic affections of the nervous system, especially dementia paralytica, locomotor ataxia, disseminated sclerosis, etc. That class of fashionable practitioners who are called "specialists" should not be allowed to make a diagnosis of neurasthenia. They should always call in the general practitioner.

The prognosis in a pure neurasthenia, so far as life is concerned, is not bad. Few cases succumb outright under process of marasmus. But in so far as restoration to complete health is concerned—that is, to restoration of mental tone and bodily vigor—the outlook is not good. In many cases the

disease has lasted so long as to induce the finer organic changes, and in some cases, as we have seen, the condition is engrafted upon an hereditary substratum. But sometimes the disease subsides suddenly. Patients will tell you that the condition of depression and weakness passed away all at once as if a cloud was lifted from the brain. The rule is rather that the amelioration is more gradual and less complete. There are times of weakness alternating with periods of comparative strength. Most patients are left more or less timid and apprehensive. As I have just said, fear is always weakness.

As the disease is built upon weakness, the corner-stone of treatment is the restoration of strength. The weakness is exhaustion, and the exhaustion can be relieved only by rest. The best treatment is therefore the rest treatment, which means tranquillity of mind and body with abundant sleep. The French have a saying, *qui dort dine*, "who sleep dines." The patient should sleep twelve or fourteen hours a day. Reconstruction is effected by food. How can you make a fire burn without fuel? But you cannot start a fire with stone coal. On account of the weak digestion the best food is milk. The patient may take fresh milk, or buttermilk, or some of its substitutes, koumiss, kephyr, etc., one to two quarts per day. The patient should be fed five or six times a day. Milk has the advantage also that it flushes toxins through the kidneys. Some day I will tell you what Aretæus said about milk. Where, for any reason, the patient may not take milk, let it be substituted with mineral waters. Any of our own pure indifferent mineral waters will suffice. The managers of the mineral springs will soon give you an *embarras des richesses* in choice. Any excessive alkalinity may be overcome by the administration at the same time of twelve to fifteen drops of hydrochloric acid in a wine-glass of water three times a day. If there is much fermentation in the stomach give the hydrochloric acid, which is the best eupeptic we have, and let the stomach be washed out once a day. Warm baths, gentle massage, faradization of the spine, stimulate the nervous system and occupy the time and the mind, so that the patient gets the benefit of occupation and suggestion. Of drugs the best is phosphorus, which may be given in substance, as Kassovitz gives it in rickets, or more pleasantly but not so efficaciously in the form of the syrup of the hypophosphites, one or two teaspoonfuls in a wine-glass of water before meals.

Of all the single remedies no one is so valuable as hydrotherapy. The bath should be warm at first and gradually cooler. The patient should be sponged off several times a day, and may with the utmost benefit lie or sit enveloped in a wet sheet an hour or two every day.

The main treatment is the mental treatment. Herein the physician may study the individual, and if possible find and relieve the fault. This part of the discussion is too long for a single lecture. Besides, this treatment must suggest itself to the physician in the individual case.

REVIEW OF MEDICINE.

MEDICINE.

IN CHARGE OF JOHN H. MUSSER, M.D.,

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AND

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On Chancriform Ulcerative Tonsillitis. (*Revue de Laryngologie, d'Otologie, et de Rhinologie*, September 15, 1895.) By Dr. Mendel.

Of all the extragenital chancres, the chancre of the tonsil certainly presents the most varied aspects and ordinarily gives the greatest diagnostic difficulties. The description of this lesion given by Albert Robin is very concise, so that, if in practice the lesion is doubtful, it will often respond to this scheme: a grayish ulceration or formation of ulcers, more or less punched out, with an indurated base and edges, and with disease of the glands. Although this description is so clear, it has not simplified the diagnostic problem. Another lesion exists which presents all these characteristics. This lesion is an affection of the tonsils, which the author has observed six times. It is a tonsillitis slow to develop and which has puzzled the most distinguished syphilographers. The patient complains of feeling a slight pain in one side of the throat at the moment of swallowing. If he is careful, he will himself notice, in a few days, the existence of a small ulcer on one of the tonsils. This lesion is surrounded by a congested area, is a circular ulcer, more or less punched out, is covered by a dirty white coat, which is nothing more than the necrosed tissue of the tonsil, and which can be imperfectly detached. The margin of the ulceration is indurated, the corresponding maxillary region presents several slightly hypertrophied glands, which roll under the finger. There is no fever. The ulcer remains stationary and heals in a varying time, usually requiring no longer than a week. In the presence of such a lesion the diagnosis should not be made hastily. Tuberculosis and syphilis should be thought of. In distinguishing this lesion from tuberculosis the general satisfactory condition of the patient, the integrity of all his organs, even of the pharynx and the larynx, ought to suffice, without speaking of the circular punched-out appearance of the lesion, which is also well defined and of rapid evolution. The diagnosis from syphilis presents other difficulties, and the lesion

is to be distinguished from a chancre of the tonsil and from a gumma. The lesion closely resembles chancre in some of its characteristics; but there are two distinguishing features. A patient having a chancre of the tonsil presents always an adenopathy, which is voluminous and which produces a true deformity of the neck on account of the presence of a glandular tumor larger than a pigeon's egg; while in chancriform tonsillitis the adenopathy exists at its minimum. The second element of importance in the diagnosis is the development of the lesion; the chancre requiring six weeks to develop, chancriform tonsillitis appearing in a week. If there is a history or if there are signs of syphilis present, the diagnosis will be more difficult. The nature of this peculiar tonsillitis cannot be positively decided; all that can be said on the subject is of the nature of a reasonable hypothesis. The opinion is advanced that the lesion is a particular form of herpes, the vesicular stage of which had passed unnoticed. This opinion is based on the condition presented by one of the six cases reported, in which, at the same time as chancriform tonsillitis was noticed, small, linear, whitish erosions were noticed along the margin of the epiglottis.

Forms of Eruption simulating Scarlatina. (*Archives of Pediatrics*, September, 1895.) By A. D. Blackader, M.D., of Montreal.

Anomalous Scarlatina. (*Ibid.*) By Louis Starr, M.D., of Philadelphia.

The scarlatiniform erythemata resulting from the administration of certain drugs are frequently mistaken for scarlet fever. Belladonna erythema closely resembles it. Salicylic acid and its compounds may give rise to a scarlatiniform rash, although this is credited with a resemblance to urticaria. The rashes of phenacetin and phenazon are generally too patchy in character to give rise to a suspicion of scarlatina. Copaiba may also induce a suspicious rash.

Transitory scarlatiniform erythemata are probably often due to accidental absorption of some toxin from the alimentary canal or elsewhere. An erythema following the use of enemata, and the erythematous flushes or distinct rashes occasionally noted in connection with cases of tonsillitis and diphtheria, are of this character. In acute desquamative nephritis we may have a scarlatinal rash with more or less fever and followed by desquamation.

The most important of these rashes, however, is seen in those cases of r  theln or rubella which present a scarlatinal rash with fever and tonsillar congestion. Here time is an important factor. The disturbance of the nervous system and the pharyngeal congestion are greater in scarlet fever. The cervical glands are enlarged early in rubella, while in scarlatina, if enlarged at all, it occurs at the end of the first week. Blackader does not find the quick pulse of as much diagnostic value as most writers.

Starr presents a series of six cases, scarlatinal in character, the first presenting an anomalous rash without other symptoms, and each successive

case adding a few details to the picture, the last two being unmistakable in type.

Cases I. and II. occurred in the same family, one sickening seven days after the other. Cases III., V., and VI. were also children of one family, two having been infected from the doubtful case.

The rash in the first four cases possessed many points of resemblance; the early eruption was erythematous, punctate in places, and of a reddish-purple tint in some regions. Maculo-papules were found as the rash extended. The desquamation was distinctly scarlatinal in type. In Cases I. and II. the temperature showed no appreciable elevation and the pulse was not accelerated. In Case III. vomiting occurred at the onset, and the temperature rose to 100° F. on one day. In Case IV. nephritic symptoms appeared during convalescence. Cases V. and VI. were attended with moderate elevation of temperature and increased pulse-rate for several days, and were distinctly scarlatinal in character.

The Lingual Traction Method of Artificial Respiration. (*Therapeutic Gazette*, August 15, 1895.) By A. E. Russel, M.D.

This author has used successfully the Laborde treatment for resuscitation of the new-born in two cases where the ordinary methods of artificial respiration were without the slightest apparent effect. After the fifth or sixth traction emesis was provoked and was followed by shallow respiration.

The mechanism of this operation is explained by Dr. Laborde as being the stimulation produced by the traction of the tongue on the sensory nerves and the reflex action on the principal motor nerves distributed to the muscles of respiration. The return of the contractions of the diaphragm is the first result produced by these lingual tractions, feeble movements at first in the epigastric region, afterwards extending upward to the thoracic region, and, last of all, the action of the muscles of the face, nose, etc.

Over fifty cases in which this method has been used for the treatment of asphyxia in the new-born have been reported from different parts of Europe. The president (M. Rochard) of the Academy of Medicine of Paris, in his report of work done in the year 1894, says, "He [Dr. Laborde] has received from all parts evidence which confirms his statements, and this year he has had the extreme satisfaction to note that colleagues up to the present time incredulous or indifferent publicly admit before this society the excellence of this method after having seen it succeed in almost desperate cases. This justice has been rendered him by Drs. Lancereaux, Verneuil, Labbe, and Perier. At the present time the lingual traction method may be considered as classic in all the cases of apparent death."

The Immediate Care of Persons found Unconscious on the Streets.—An editorial in the July 27 number of the *Medical and Surgi-*

cal Reporter, after denouncing the inefficient aid given to persons found unconscious on the streets, calls attention to a circular issued by a committee of the Medical Society of the County of Kings, which contains methods insuring prompt medical and humane treatment to those who for any cause are rendered unconscious on the streets or elsewhere. The following points are recommended to the consideration of the members of all medical societies, health boards, managers of hospitals, police authorities, etc. :

1. Whenever a person is found in an unconscious or semi-conscious state on the street or elsewhere away from his own home, the police, when notified of such case, shall immediately summon medical aid ; sending for the ambulance surgeon, or for the police surgeon ; or in towns where there are no such officials, then for the nearest physician, who should be compensated for his services by the authorities.

2. The police shall not decide as to the disposition of such a case, but must await the decision of the ambulance surgeon, police surgeon, or of the physician called, and must act in accordance with such decision.

3. A police officer who acts in opposition to such decision should be by the ambulance surgeon, the police surgeon, or the physician, reported to the police commissioner, who should subject such officer to discipline, rules governing such cases having previously been made and promulgated.

4. Ambulance surgeons should give prompt and immediate aid to patients found in the condition hitherto described, and remove them to the nearest hospital, or to their homes when ascertainable, according as their judgment dictates is the best course to pursue in the interest of the patients. The existence of an alcoholic complication in the case should in no wise adversely influence the surgeon or physician called as to the disposition of the case, as such a complication often renders skilful medical treatment the more imperative.

5. Ambulance surgeons, and other medical men, brought in contact with cases in which alcoholism is a frequent complication, should be reminded that this condition often renders an immediate diagnosis impossible in the most serious and oftentimes fatal forms of cerebral disease and injury, as well as in other diseased conditions.

6. The examination of ambulance surgeons should include the differential diagnosis of alcoholic coma from other forms of coma, and the various diseases or injuries that may produce a condition simulating alcoholic intoxication.

7. Hospital authorities receiving financial aid from the city should not refuse admittance to patients suffering from supposed alcoholism, for in so doing they are liable to be contributory to the death of such patients. They should know that, if the condition be one of uncomplicated alcoholism, this fact will in a short time be revealed, and other disposition may be subsequently made of the case ; while, if the patient is so affected as to need immediate and skilful treatment, his rejection by the hospital authorities may conduce to a fatal result. If they refuse to receive such cases,

because complicated with alcoholism, they should be held legally responsible for the results. And, further, if such refusal is persistent after their attention has been called to the matter, the city authorities should strike the name of such hospital from its list of beneficiaries.

8. The municipal authorities should also consider the question of the establishment of a special emergency hospital, or hospitals, conveniently located with reference to the various districts of the city; or a system, similar to that of the Bureau d'Admission in Paris, connected with which there is a special hospital for all cases of alcoholism, or cases complicated with alcoholism, that may occur in the streets of that city. Or, the authorities might consider the establishment of a special department in connection with the hospitals of the city, similar to the "Alcoholic Wards" of Bellevue Hospital, New York, where more than four thousand alcoholics are annually treated. Such a plan would relieve the general hospitals of the burden of such cases, or compel them to make special provision for their care. Should the existing methods prove inadequate, the committee recommends some such plan as is here outlined.

THERAPEUTICS.

IN CHARGE OF ALEXANDER D. BLACKADER, B.A., M.D.,
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ASSISTED BY
D. J. EVANS, M.D.

Creosote Carbonate in the Treatment of Pulmonary Tuberculosis.
(*New York Medical Journal*, August 7, 1895.) By Louis Fischer, M.D.,
of New York.

By the introduction of creosote carbonate as a substitute of the crude drug von Heyden placed at the disposal of the profession a non-irritant, non-poisonous preparation containing ninety-two per cent. of the purest creosote from beechwood tar, chemically combined with eight per cent. carbonic acid, borne well in large doses by the most delicate stomachs. It has made it possible to employ the drug in sufficiently large doses, so that the results obtained have been very good. To prove the elimination of the drug, not only the breath gives ample evidence of it, but also the dark color of the urine shows that the drug has been absorbed and excreted.

In the cases reported the hygienic surroundings have been of the poorest, and, although the author does not wish to state that the patients would have been cured unless other factors had been considered, he attributes the result mainly to the efficacy of creosote carbonate. The test for determining a benefit has been the scales, any increase in weight, allowing for the normal physiological increase of weight in children, being attributed to the efficacy of the drug.

In the case of a girl, twelve years of age, with catarrhal tuberculosis affecting the apices of both lungs, the process was arrested in its incipiency. Three drops of creosote carbonate were given three times a day, with an increase of two drops each day until twenty drops were given for a dose. The child gained twenty-nine pounds in nine months, and the tubercle bacilli, plentiful in the sputum, expectorated in the early morning hours, entirely disappeared.

Another child, two years old, weighing twelve pounds, was given two drops, and the dose increased one drop every three days until ten drops were given three times a day. The emaciation, excessive diaphoresis, and cough began to disappear after the first ten days, and later the tubercle bacilli which were found in muco-purulent matter in the fæces disappeared.

The author wishes to emphasize the importance in these cases of making a correct clinical and bacteriological diagnosis; of determining the patient's weight, allowing for physiological increase; and, in giving the drug, of increasing the dose after an interval of a few days. He has seen the best results from the administration of creosote carbonate after meals. An examination of the blood of patients during the course of the treatment has shown that the percentage of hæmoglobin is materially increased, and that the relative proportion of the red and white blood-corpuscles is considerably increased in favor of the red corpuscles.

The Inquiries of M. Reichmann upon the Influence of Bicarbonate of Sodium upon the Stomach Secretion. (*Gazette des Hôpitaux*, September 10, 1895.) By Dr. Albert Mathieu.

M. Reichmann, after a series of personal observations, concludes that bicarbonate of sodium has no action upon the secretory power of the stomach; it always influences the gastric juice already secreted in a manner which tends to neutralize it and to make it alkaline. According to this statement one can expect only to diminish the total acidity of the stomach contents by the use of the bicarbonate of sodium: he cannot expect to influence the secretion of the stomach mucosa itself for a single meal or for a period of time more or less prolonged, neither immediately nor slowly. The symptoms caused by the exaggerated acidity of the gastric juice will then be the only indications for the therapeutic use of the bicarbonate. It will be able to render signal service, for instance, in saturating the hydrochloric acid in excess in the hypersecretion of hydrochloric acid; but it will not produce any lasting benefit or any definite cure of the disease. The following objections may be made to Reichmann's conclusions: First, the technique which he has followed is far from being perfect; second, the examination of the gastric juice has often been made too soon after the administration of the drug, before it has had time to produce appreciable modifications in the secretion of the stomach; third, certain of his results are contradictory to his negative conclusions; and, fourth, he has not taken into

account the operation of dyspepsia, an element which former experiments have shown to be of great importance. The author thinks that bicarbonate of sodium, properly employed, ought to stimulate the glands of the stomach to their maximum secretion. The augmentation of secretion is naturally more apparent in hypo- than in hyperchlorhydrie. When the dose given is too large, or when the use of the bicarbonate is too prolonged, a diminution of the secretion ought to succeed the augmentation. This depressing influence is much less marked in cases of hyperchlorhydrie. Severe cases of the hypersecretion of hydrochloric acid do not appear, in general, to be sensibly influenced by the prolonged use of alkalis. There is, without doubt, in these patients an increase in the number of border cells which secrete the hydrochloric acid. The present state of our knowledge of the influence of the bicarbonate of sodium upon the secretion of the stomach may be summed up as follows:

1. Bicarbonate of sodium produces immediately the total or partial saturation of the acidity of the stomach.
2. When the dose used is sufficiently large the alkalization remains definitely and the peptic digestion is stopped.
3. With a smaller dose the secretion of hydrochloric acid continues after the bicarbonate of sodium has been completely transformed into chloride of sodium, and it should be even stronger than before.
4. When one gives a sufficient dose of bicarbonate of sodium an hour before the meal, the motion and secretion of the stomach are excited. The excitation of the secretion appears more marked in the cases of hypo- than in the cases of hyperchlorhydrie, when the hypochlorhydrie is not the result of a too far advanced atrophy of the glandular elements.
5. It is necessary to give account, not only of the immediate action of the bicarbonate of sodium upon a meal, but also of the prolonged and distant action of the remedy.

The Antiseptic Treatment of Typhoid Fever with the Chlorine-Quinine Solution. (*Medical News*, September 14, 1895.) By Emil King, M.D., of Fulda, Minnesota.

A country practitioner is forced, from considerations of expense, convenience, and prejudice, to adopt some line of treatment in cases of typhoid fever other than the Brand method. Of all the methods of treatment receiving professional sanction, the one having antiseptics for its basis seems the most rational. No one of the advocates of the antiseptic treatment claims that he can obtain an aseptic condition of the intestinal walls; but it is claimed that the bacterial growths can be kept down to small numbers and in a low state of vitality, and that the bacterial poisons are very much lessened, and consequently not present to be absorbed. The main point to be considered in choosing an intestinal antiseptic is to get one that is readily soluble, very diffusible, easily absorbable, and that is, in overdose, harmless. The substance best combining these advantages is chlorine. The chlorine-

quinine treatment was originated by J. Burney Yeo, of London, and has been successfully employed for about twenty years. The best results are obtained if the case is seen early; but even at a late stage the remedy will have a good effect. The advantages in favor of this line of treatment may be enumerated as follows:

1. The temperature is materially affected, being appreciably lowered. It seldom rises above 102.6° F. after the medicine has been administered for two days.

2. There is almost an entire absence of nervous symptoms. The so-called typhoid condition does not develop. The patient is usually able to get considerable sleep, and the headache soon disappears.

3. The general condition of the alimentary canal is much better. The foul tongue clears to some extent, so that it may even lose its peculiar character; the stomach retains nourishment better; diarrhoea is seldom severe, and tympanites does not develop except over a limited area in the right inguinal region.

4. The duration of the disease is distinctly shortened, and convalescence is more rapid. Many cases will show a normal temperature by the eighteenth day, few going on to the twenty-fourth. Convalescence is more rapid because the patient is not so weak.

5. Complications are fewer, and the mortality is greatly lessened.

In this country twenty-six cases have been reported, with no deaths.

On the Use of Aristol Subcutaneously in the Treatment of Tuberculosis. (*Therapeutische Wochenschrift*, September 1, 1895.) By S. S. Grusdieff, of St. Petersburg.

The author gives first an extensive history of this medicine, which was produced by Messinger & Wortmann in 1890, and was first used by Nadaud in tuberculosis. The results he obtained were favorable, while those observed by Ochs, using the drug in the same manner, with a one-per-cent. solution of aristol in sweet almond oil (filtered and heated to 120° C. for some hours), were not so promising. Grusdieff's observations were made in the Sailors' Hospital in Kronstadt in 1893 and 1894, December to February. He used for injection solutions of one to fifteen per cent., in the beginning pure, in the second week with an addition of cocaine. The injections were made at the back two or three times a day for three or four weeks. Patients complained of severe pains, lasting two or three hours after injection, but later got accustomed to them. Thirty-three patients were treated for tuberculosis, eight of these stopping treatment after the tenth day.

The treatment consisted exclusively in injections of 0.01 to 0.45 aristol per day. Neither narcotics nor antipyretics were given.

The author gives then the details of the observations, and comes to the conclusion that the truth lies between the two different opinions of Nadaud and Ochs. Grusdieff does not doubt that in the great majority of patients suffering from tuberculosis, apart from the pain, which is not so difficult to

bear, the aristol injections are not harmful, but do not influence much the process in the lungs, while in a few cases it can be of great use.

As there are so few means to fight tuberculosis, excepting climatic treatment, which can be used by but few people, he recommends the further study of the aristol on animals as well as on men, to see if good effects can be obtained in the end.

SURGERY.

IN CHARGE OF HENRY R. WHARTON, M.D.,

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AND

JOSEPH P. TUNIS, A.B., M.D.,

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Fractures of the Lower Extremity treated by Fixed Dressings and Early Motion. (*Beiträge zum Centralblatt für Chirurgie*, No. 27, 1895.) By Professor Bardeleben.

This author reports the results of his method of treating fractures of the lower extremity with dressings permitting the locomotion of the patient and the employment of early passive motion.

This method was employed in all cases except in the aged and infirm, the very young, and in those cases in which amputation was a possibility. In the past year he treated fifty-eight cases of fracture of the lower extremity including the patella, making a total of one hundred and eighty-one cases in which he has employed this method. In no case were the results other than could be desired. The advantages to the general health of the patient and to the affected member were always marked. The time required for healing was shorter than usual. There were no complications, such as muscular atrophy, senile catarrh, and delirium. Joints not involved in the fracture could be easily moved after healing had taken place.

Three Cases of Laparotomy for Penetrating Wounds of the Abdomen, with a Report of Fifty-six Cases. (*Boston Medical and Surgical Journal*, July 25, 1895.) By Charles L. Scudder, M.D.

The causes of death in the cases tabulated were as follows: Wound of the colon; wounds of the small intestine; infection from a hernia of two feet of bowel through the perforated abdominal wall; wound of the liver, the kidney, and the chest wall; two cases of wound of the spleen, death from hemorrhage; gangrenous hernia through the abdominal wall; stab in a pregnant woman; hernia of the bowel, great shock, abortion, peritonitis; secondary infection from abscess at seat of injury.

From the study of these cases the following conclusions were reached: Given an abdominal wound, proof of penetration through the peritoneum should be sought. This is best accomplished by enlargement and careful investigation of the original wound. Penetration having been found, immediate enlargement of the wound should be made for careful exploration of the abdominal contents. Irrigation with warm salt solution should be employed if there is any soiling of the peritoneum, and if there is much blood present. The use of the probe to determine penetration is often misleading, and may give a false sense of security. The absence of shock does not disprove the presence of grave intraperitoneal lesions. A small parietal wound is not incompatible with grave intraperitoneal injuries, as is evidenced by one of the cases. The possibility of intraperitoneal strangulation through the wounded omentum must be kept in mind. Dennis, Morton, and Markoe each report a case of intraperitoneal strangulation associated with the conditions resulting from a stab. The objects of a laparotomy following intraperitoneal stab-wounds of the abdomen are to discover (if present) and check intra-abdominal hemorrhage, to close perforations of viscera, and to prevent peritonitis and sepsis.

The Origin of the Stitch Abscess. (*Beiträge zum Centralblatt für Chirurgie*, No. 27, 1895.) By Dr. C. Lanenstein, of Hamburg.

The author's attention was attracted to the study of this matter by the observation of infection occurring after aseptic operations which could only be explained by supposing the infection to be due to suture or ligature material. Consequently, he instituted a bacteriological examination in the case of two hundred and sixteen specimens of sutures and ligatures. In these two hundred and sixteen specimens he found sixty-four which contained bacteria that were capable of development. The majority were bacillus subtilis, which was found in different culture media, including gelatin, glycerin, agar, bouillon, blood serum, and alkaline albuminate. He also found the micrococcus tetraginus and the staphylococcus albus. The author comes to the following conclusions:

1. Clinical observation teaches that cases of suppuration occur which have their origin in the catgut employed in the wound.
2. It cannot be said for certain in any individual instance that the catgut has been the bearer of the infection.
3. It is nevertheless certain that the so-called sterile catgut of the shops contains germs capable of development.
4. So long as this is the case the catgut cannot be free from the suspicion of having given rise to the infection of a wound.

In the discussion which followed, Kocher, of Bern, said that since 1888 he had used silk in his enucleations of goitre. This can be absolutely sterilized either by dry or moist heat, an impossibility with catgut. In referring to his cases he had only thirty-five per cent. heal by primary union while he used catgut, while eighty-five per cent. healed in that manner

since he began to employ silk. Kocher believes that the suture material should be not only aseptic but also antiseptic, and has, in consequence, during the last winter kept it in a solution of arsenious acid, with the result that he has, in thirty-five cases in which it was employed, secured absolute primary union.

The Radical Treatment of Hydrocele by the Injection of Iodine, and its Final Results. (*Beiträge zur klinische Chirurgie*, Heft 3, Band xiii., 1895.) By Dr. Spahinger.

After a careful comparative study of the methods employed for the radical cure of hydrocele, both by incision and by the injection of iodine after puncture and withdrawal of the fluid, the author comes to the conclusion that, in every case, that operation is to be performed which produces the least functional derangement, which has the shortest course, and which has the least chance of unforeseen complications.

Puncture with the injection of iodine, he believes, fulfils these conditions more nearly than any other method, although it has a greater percentage of relapses. It should be used in all normal cases, the operation by incision being reserved for persistent and complicated cases.

The author bases his opinion on results obtained in the Zurich clinic. Of seventy cases treated, forty-eight were injected with iodine; thirty were cured, five relapsed, and thirteen were not heard from later. The average length of time in the hospital was fourteen or fifteen days. Of seventeen cases treated by operation twelve were cured. No relapses were seen, although five cases were not heard from. The time spent in the hospital was, however, on the average from thirty-eight to forty-two days.

Puncture of the Spinal Meninges. (*Berliner klinische Wochenschrift*, April 1, 1895.) By P. Fürbringer, M.D.

The Diagnostic Value of Lumbar Puncture. (*Ibid.*, July 8, 1895.) By E. Stadelmann, M.D.

Fürbringer has treated eighty-six cases, making more than one hundred punctures. The technique of the operation is very simple. The patient is placed in a sitting posture with the body bent forward, and the puncture is made at the level of the under surface or at the extremity of the spinous process. With Naunyn and Lichtheim the author holds that an anæsthetic is unnecessary. He finds that the aspiration of the fluid causes more pain than the puncture. The head, neck, and back are complained of. To prevent this he now uses a Pravaz syringe instead of the needle. The quantity of fluid withdrawn varied from a few drops to one hundred and ten centimetres. It was occasionally bloody or stained.

In thirty of thirty-seven cases of meningitis the tubercular character was proved by the presence of tubercle bacilli in the cerebro-spinal fluid. The author considers this method as bearing the same diagnostic value in tubercular meningitis that the bacteriological examination of the sputum,

the pleural and peritoneal fluids, and the urine does in tuberculosis of the lungs, the kidneys, etc. In one case pus was withdrawn.

The therapeutic results were not very promising. In a case of chronic hydrocephalus with epileptiform attacks the fits were lessened by puncture. In three cases of cerebral tumor, one had less headache, one did not improve and proved syphilitic, and one died suddenly the next day. In two cases of chronic diffuse nephritis no improvement took place.

Stadelmann reports two cases similar to one cited by Lichtheim in which the symptom-complex indicated purulent meningitis, but the aspirated fluid was only very slightly cloudy and contained no micro-organisms.

In the first case an autopsy revealed a fracture at the base of the cranium, fissures of the orbital roofs, and pus and blood on the surface of the convexity of the brain.

The second patient had for a long time complained of headache and nausea which followed a purulent otitis of the left ear. On entering the hospital the case presented the clinical picture of purulent meningitis. Lumbar puncture was made and a water-clear sterile fluid obtained. At the autopsy chronic purulent meningitis was found with pus containing staphylococci and streptococci.

The author concludes that a cerebral meningitis may run a long course without extending to the spinal meninges, and that although the diagnostic value of spinal puncture is greater than its therapeutic or curative effects, it is not entirely positive. Errors in diagnosis may occur in the following manner. The aspirated fluid in purulent meningitis may be, as in the cases cited, clear and sterile, causing the exclusion of pus. In a certain percentage of the cases of tubercular meningitis the tubercle bacilli are not found. In all cases where a clear sterile fluid is aspirated the diagnosis may vary between chronic hydrocephalus, cerebral tumor, and simple serous meningitis.

The author also calls attention to the following points: 1, the occasional painfulness of the aspiration; 2, the varying quantity of fluid withdrawn without regard to the amount of pressure. Both conditions find an explanation, in the author's opinion, in the partial occlusion of the canal, usually between the fourth and thirteenth ventricles, which, whether due to inflammation, to coagulation, or to pus-flakes, causes the fluid to flow slowly through the remaining pervious lymph-spaces, and a low pressure results. The brain, after the draining of the subarachnoidal fluid, becomes sucked as it were by the dura and pressed against the cranium, causing the severe pain.

Imbrication or Lap-Joint Method. A Plastic Operation for Hernia. (*Chicago Medical Recorder*, August, 1895.) By Edward Wyllys Andrews, M.D., Chicago.

The interlocking or overlapping principle of uniting the musculo-aponeurotic layers of the abdomen was first adopted by the author as an expedient in cases where the Bassini operation seemed difficult and supplementary tissue was needed to aid in filling in the gap around the ring; but

in practice the value of the principle became more and more evident, and he now employs it in all his operations. It consists in the incorporation of a strong layer of external oblique aponeurosis into the posterior wall of the canal, along with as much conjoined tendon and transversalis fascia as can be found, and the preservation of another flap of the same strong fascia to form the anterior wall. The purpose is to lap joints in uniting the several layers of the wound. In the completed operation we thus have three strong layers of aponeurosis in the place formerly occupied by two, two of these being at a point of greatest strain,—namely, behind the cord,—and all shortened or narrowed by an amount equal to the extent of overlapping.

Conclusions: Any successful method of radical cure must be a true plastic operation upon the musculo-aponeurotic layers of the abdominal wall. Cicatricial tissue and peritoneal exudate are of no permanent value.

NEUROLOGY.

IN CHARGE OF LANDON CARTER GRAY, M.D.,
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AND

WILLIAM BROADDUS PRITCHARD, M.D.,
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Total Compression of the Upper Dorsal Cord. (*Archiv für Psychologie und Nervenkrankheiten*, vol. xxvii., No. 1.) By F. Egger, M.D., former assistant to Professor Hitzig.

The author describes a case of trauma of the first dorsal segment. The patient survived total destruction of the cord at this point eleven years. This alone is sufficient to make the case remarkable. The patella reflex failed, the plantar reflex was present. There was a considerable degree of mental disturbance (hallucinations). At the autopsy the cord was found compressed by the upper dorsal vertebrae, much altered in shape, and without the slightest trace of the normal division of the white and gray matter at this level. Microscopically a descending comma-shaped degeneration was found in the positive cord as far as the tenth dorsal. This long extent makes it doubtful if it can be considered the same as the well-known band of descending fibres described by Schultze. Above the lesion the direct and crossed pyramidal tracts showed a retrograde degeneration. The muscles, especially those of the lower extremities, showed marked degenerative change. The author discusses the loss of the knee-jerk in total cord destruction, claims that the honor of noticing this fact for the first time does not belong to Bastian, but to Kadner (1876), and thus brings the German school into prominence. He suggests that the mental disturbance may have been due to a loss during eleven years of all sensation from a large part of the body, and to vasomotor trouble. He speaks of the theory of Allen Starr (*Brain*, iii., 1894) for the wrong location of sensation, but

concludes that in his own case the twistings produced in the lower part of the body were transmitted to the sensitive portion above the third rib, and thus led to a mistake in location on the part of the patient. Loss of patella reflex can be due to such muscular change as was found in this case, but such a theory does not explain the loss which sometimes occurs immediately after a total transverse lesion high up in the cord, before muscular atrophy has had time to develop. He discusses at length the loss of the knee-jerk, and calls attention to the fact that in some cases of cerebellar tumor where this has failed change has been found in Westphal's entrance zone of the lumbar cord; that in other cases great central pressure had been noticed at the autopsy. Especially in cerebellar tumor is such pressure common.

W. G. S.

Experiments upon the Influence of Sensory Nerves upon Movement and Nutrition of the Limbs. (Communication made to the Royal Society, March 7, 1895.) Preliminary communication by F. W. Mott and C. S. Sherrington.

All the sensory roots pertaining to the arm and leg were cut. When the monkeys recovered from the narcosis a loss of movement was at once noticed in the hand and foot,—in the upper portion of the limbs this was seen in a less degree. After the sound members were tied the animals were unable to seize and carry any food to their mouths. There was slight flexion in both limbs. After a period of three months no change in the condition had occurred. The associated movements were much less influenced; the finer, more specialized movements were those most affected.

When the cortex was irritated by medicinal means the epileptic convulsions thus produced were equal on the two sides. It was then shown that there is a difference between voluntary movements and those due to cortical irritation; for the former the entire sensory tract from the periphery to the cortex is needed.

To produce any marked change in movement all the sensory nerves supplying a part must be cut, otherwise those which are left act vicariously, and when only one is cut anæsthesia is not even produced.

When the fibres which supply the muscles are spared, and the others in the part are cut, the disturbance of motion is equally great, thus showing that the muscular sense is not of great importance in these experiments.

Wounds intentionally produced healed as rapidly on the paralyzed side as on the sound, and no trophic disturbances were noted.

Judging from the secondary degeneration all the fibres of the column of Goll seem to come from the lower extremities; roots which were cut higher up produced no marked change in this column.

The chief value of the experiments lies in the demonstration of the necessity of centripetal impulses from the skin and partly from the muscles of the palm of the hand and sole of the foot for the production of the finer movements of the extremities.

W. G. S.

Abscess of the Brain from Ear-Disease. (*Edinburgh Medical Journal*, August, 1895.)

Dr. Leith recently exhibited before the Medico-Chirurgical Society of Edinburgh the temporal bone of a girl, aged fifteen, who died from symptoms pointing to tubercular meningitis. She was only fifteen hours in hospital. The real cause of death, as ascertained post mortem, was a large abscess immediately below the convolutions, just at the junction of the parietal and occipital lobes, two inches in diameter, and with a well-formed capsule indicating a duration of at least three or four months, and probably much more. It was nearly as large as a duck's egg. There was extensive encephalitis in the neighborhood, extending especially downward and inward, the greatest prolongation being towards the internal capsule, into which it would probably soon have discharged. He examined the right ear and found a striking condition of the tympanum. The lining of the middle ear was caseous, evidently from caries, and soft enough to be cut away with a knife. The tympanic membrane was seen to be completely ossified, and showed a large perforation of the size of a porcupine quill at the upper end. The ossicles were perfect. The tubercular process had just extended towards the inner ear. It did not affect the mastoid cells. He believed the bone on the other side was also affected, but could not be absolutely certain. The first symptoms appeared three weeks before admission, headache and vomiting, which persisted for two days and gradually disappeared; but the headache persisted, and the patient remained in bed and became drowsy, and finally comatose. The eyes were not examined until after admission. The house-physician examined the left eye and found marked optic neuritis.

There was no ear-discharge, but Dr. Leith found a plug of wax about one inch long filling up the external meatus.

Insanity and Bright's Disease. (*American Journal of Insanity*, July, 1895.) By E. D. Bondurant, M.D.

The author has examined seventeen hundred cases of insanity admitted during the last four years to the Alabama Insane Hospital, besides chronic cases, chiefly chronic resident at the beginning of this period. At least one careful physical examination and urinalysis has been made, and in those cases where bodily disease of any importance, real or otherwise, has been noted there have been repeated examinations of the urine. Post-mortem renal lesions have been studied microscopically in more than two hundred cases. Dr. Bondurant finds that albumin, together with renal tube-casts, can be detected in the urine of more than one-half the cases of chronic insanity treated in this institution, and in the urine of quite seventy-five per cent. of the cases of recent insanity admitted. That a large proportion (*not all*) of the patients whose renal secretion is thus abnormal exhibit at some time some other evidence of renal disorder. That a smaller percentage, say twenty-five per cent., of those whose urine contains tube-casts

and albumin present such clinical evidences of nephritis as would enable any competent practitioner to make the diagnosis of kidney-disease or complication without examination of the urine. That seventy-five per cent. of the kidneys examined post mortem show pathological changes.

Finally, the facts obtained seem to justify the opinion that many of the patients (not all) in whom insanity and nephritis coexist are insane because of the nephritis,—i.e., the insanity is one of the mental symptoms of acute or chronic uræmic intoxication.

OPHTHALMOLOGY.

IN CHARGE OF CHARLES A. OLIVER, A.M., M.D.,

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AND

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Atheroma as a Complication in Cataract Extraction. (*Fort Wayne Medical Magazine*, August, 1895.)

K. K. Wheelock, of Fort Wayne, Indiana, believes that atheroma constitutes an element requiring very careful consideration in the operation for cataract. This he bases upon three carefully-detailed cases occurring in his own practice. He says that the fact "that the surface operated is small does not lessen the fact that structural changes dependent upon defective nutrition may follow the incised wound made in the cornea, because this tissue must be repaired both by direct blood-supply, as well as indirectly through imbibition, depending upon the location of the wound." He thinks that if the incision lie within scleral tissue, we have direct repair; if in the corneal tissue wholly, then the repair is by imbibition. He believes that the form of destruction following operations on tissue supplied by atheromatous vessels is molecular gangrene or necrobiosis, as in this form the nutrition is most interfered with in the process of reforming the structural elements.

Several Considerations on the Application of Electrolysis in Twelve Cases of Detachment of the Retina. (*Annales d'Oculistique* (English edition), July, 1895.)

Based upon a series of observations and a careful consideration of various methods employed, Terson, of Toulouse, has been able to draw the following conclusions:

"1. Positive electrolysis should be applied to recent retinal detachment, and it will have the greater chance of success the sooner it is used after the onset of the accident.

"2. This method of intervention interferes in no way with the use of

all the methodical methods recommended for lesions of diathetic origin, the value of which has been shown by long experience from the palliative stand-point.

"3. Clinical observation and experiments on animals prove that the application of a current of five milliampères of one-minute duration is inoffensive to the eye."

A Clinical Study of One Hundred and Sixty-Seven Cases of Glaucoma Simplex. (*Archives of Ophthalmology*, vol. xxiv., No. 3, 1895.)

In an elaborate paper upon this subject, the findings of which are representative of a careful and extended examination made upon twenty-two thousand six hundred and eighty patients, seen in the services of Norris and Oliver, at Wills Eye Hospital, Zentmayer and Posey, of Philadelphia, embody their results into the following interesting and valuable conclusions.

"Simple glaucoma occurs in either sex with about the same degree of frequency, but manifests a preference for the eyes of males. The majority of cases occur in the beginning of the fifth decade. It is quite uncommon, occurring in about .736 per cent. of the cases which seek treatment at ophthalmic hospitals. All forms of ametropia are equally liable to this affection. With the exception of articular rheumatism and influenza, which appear to induce changes that favor its development, there are no other particular systemic diseases which predispose to it. It is a binocular affection, although a period of twenty months usually intervenes between the manifestation of the symptoms in the two eyes. The two most prominent subjective symptoms are failing sight and headache, but neither of these possess characteristics which would serve to differentiate them from those occurring in other forms of ocular disease. This form of glaucoma is slowly progressive, two and a half years being the average length of time required to induce blindness after the appearance of the initial symptoms. Signs of irritation in the anterior segment of the eye are usually absent, but 4.52 per cent. of the cases exhibit such changes. An inflammation of the optic nerve is a constant attendant upon glaucoma, being noted in every eye containing a pathologic excavation. It manifests itself as a low-grade neuritis affecting the entire structure of the nerve, and seems to render the nervous tissue more liable to the peculiar kind of excavation which is the most constant characteristic of glaucoma. No one of the four findings most commonly observed in glaucoma is essential to the disease, for the disease may occur without an excavation, without the field being contracted, without the diminution of central visual acuity, or without rise of tension. The excavation, however, is the most constant symptom, occurring in 81.43 per cent. of all the eyes which were examined. Although the excavation shows a marked predilection to occupy the temporal half of the disk, no part of the nerve escapes. In exceptional cases the excavation

appears at the temporal edge of the disk as a continuation of the physiological excavation. From here it gradually spreads over the head of the nerve, encroaching upon its structure until only a narrow rim of nerve-fibres remains at the nasal edge. Central visual acuity may remain normal although the field for form and color be encroached upon (in 10.77 of the cases).

"The tendency of the scleral ring to become visible all around the disk, and its disposition to broaden especially to the temporal side, are significant of the degree of intra-ocular tension to which the globe has been subjected, and go hand in hand with the extent and depth of the excavation. As the broadening of the ring, however, usually appears before the excavation, its presence in eyes possessing other symptoms of glaucoma should always excite suspicion of this disease.

"Opacities in the refracting media are found in an unusually large percentage (86.52 per cent.). These, however, are to be regarded as being more the result of senility than expression of the glaucomatous state. Arcus senilis (35.92 per cent.) and lenticular opacities (28.44 per cent.) are the most common, while corneal opacities, directly traceable to the increased intra-ocular tension, occurred in 20.38 per cent. of the eyes. Vitreous opacities occur in but few instances, and, originating in a choroiditis which complicates the disease, are not an essential feature of it.

"The cornea is the most liable of the refracting media to be affected by the glaucomatous process. The increase in intra-ocular tension as determined by palpation is not necessarily a constant factor, being detected in one hundred and nine cases (32.63 per cent.). Where the tension is increased, the field will be distinctly cut or the nerve excavated. Rigidity of the sclera is often the first indication of increased ocular tension. This rigidity may be accounted for either by a connective-tissue thickening in that tunic, or by an actual increase in the intra-ocular tension rendering the sclera more resistant to the examining finger. The shallowing of the anterior chamber exists in eyes where there is no excavation, but the converse is not true, for in every eye where there is an excavation the chamber will be shallowed. This would seem to show that the shallowing of the chamber occurred before the increased tension had excavated the nerve. As the chamber grows shallower and the tension higher the pupils will become larger, and the larger the pupil the less will there be reaction to light. This is not always true, however, for in twelve instances where the tension was distinctly elevated, and there were well-marked excavations, the pupils were but two and a half millimetres in size and they responded perfectly to light and convergence stimuli. Other signs of increased intra-ocular tension, such as the choroidal halo and the venous and arterial pulses occurring in such a small proportion of cases, show that they are not constant factors of the disease, and their absence cannot be regarded as negative evidence for the existence of a glaucomatous state. Increased tension limits the action of accommodation in only 34.88 per cent. of the cases.

In the great majority of the cases the limitation of the field consists in a concentric contraction for color and form to an equal extent.

“The consideration of the relative amount of contraction in the form and color field, often adopted in the distinction between an atrophic and a glaucomatous excavation, is valueless, as the findings show that in quite a large proportion (13.06 per cent.) of the cases the color field was relatively more affected than the form. Indeed, in sixteen of these thirty-two cases (50 per cent.) the form field was normal whilst that for red was contracted to twenty degrees or less. Contrary to the findings of other observers, the most frequent type of restriction of the visual field consists in concentric limitation of the entire field, and not in the contraction to the nasal side. The limitations of the field in this latter position in 7.92 per cent. of the cases evidenced that this portion of it was peculiarly liable to be affected by the glaucomatous process, for the other portions were not equally affected by the disease. Full fields are not inconsistent with glaucoma, for in one hundred and twenty-nine eyes where the state of the tension, the degree of the visual acuity, the character of the excavation, and the extent of the field were noted, thirty eyes did not exhibit any lessening in the extent of their fields for form or for color.”

OBSTETRICS AND GYNÆCOLOGY.

IN CHARGE OF RICHARD C. NORRIS, M.D.,

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Total Hysterectomy by a New Vagino-Abdominal Method. (*Annals of Gynæcology and Pædiatry*, September, 1895.) By Albert H. Tuttle, M.D., of Boston.

Preparation of the Patient.—When the result of an examination determines for the first time the requirement of hysterectomy, the physical and constitutional condition of the patient are carefully noted, and unless they are favorable for an operation she is placed on tonic treatment and the heart-beat regulated. Especial attention is paid to the examination of the urine and kidneys, which almost always show some defect; and unless there is about the normal secretion of solid constituents, operation is deferred.

If the uterus is enlarged and filled with soft cancerous or sarcomatous material, which for some time previously have been attended with exhausting discharges of a serous or bloody character, a preliminary thorough curettement, followed by rest in bed, will result in a very short time in the temporary improvement of the physical condition of the patient.

For a few days before the operation the patient is given a liquid diet

and kept quiet in bed. By packing the vagina daily for a week before the operation it will be stretched and softened considerably, and give greater facility for the after-manipulation. The day before the operation the bowels are thoroughly cleared of all fecal matter, and made less septic by the administration of ten grains of calomel in one dose, about noon, followed by teaspoonful doses of magnesium sulphate every hour until several movements have occurred. The hair over the pubes is then shaved away, the patient given a warm bath and scrubbed with soap, rinsed with bichloride solution (1 to 5000), which is allowed to dry on, dressed in sterilized clothing, and put to bed, with a bichloride pad over the abdomen, between sterilized bedclothing.

For supper is given a hot drink of malted milk or similar food. On the morning of and at least four hours before the operation rectal enemata of warm water are repeatedly given until the return is clear, then a vaginal douche of bichloride (1 to 1000). The lower limbs are clothed with woollen wraps, two ounces of whiskey and twenty minims of freshly-prepared tincture of digitalis are administered by the rectum before the patient is taken to the operating-room, and at the beginning of the operation $\frac{1}{4}$ grain morphine, $\frac{1}{150}$ grain atropine, and $\frac{1}{10}$ grain strychnine are given subcutaneously in one dose.

In order to avoid all unnecessary length to the period of anæsthesia, the ether is not given until the preliminaries are nearly completed, and in the beginning is often substituted by the use of chloroform, either pure or in the form of the A.-C.-E. mixture.

Operation.—A short speculum is introduced into the vagina and the perineum depressed. With the help of vaginal retractors the cervix is exposed to view and drawn as far as it will come into the introitus by means of tenacula forceps. A probe is now passed, and the direction, shape, and size of the uterine canal determined. Unless the canal is freely patent it is dilated with Wathen's instrument and treated with equal parts tincture iodine and carbolic acid, applied on a cotton stick. The excess of iodine, blood, etc., are irrigated away, and, if the character of the disease is other than cervical cancer, the cervix is firmly held and a circular incision is made, simply cutting through the vaginal structures about the uterine neck, sufficiently remote from the uterus to include within it all diseased tissues, at the same time keeping as close as possible to the os, as in the usual manner of performing vaginal hysterectomy. In most cases this manœuvre is comparatively simple; but with a large tumor in a single woman somewhat advanced in age, with a rigid vagina, narrowed and elongated by long-continued upward traction exerted by the uterus as it is forced out of the pelvis to seek room for the growing tumor, and with a cervix perhaps almost entirely "taken up" by the distention exercised by the new growth, or with a senile uterus firmly fixed by old adhesions in the upper region of the pelvis, and nearly hidden from external inspection by the contraction of the vagina that occurs after a certain age, it is a matter of great diffi-

culty, and, contrary to what might be expected, little help will be gained by incision of the sphincter vaginæ.

The uterus is now separated from its anterior and posterior attachments and coverings as freely as possible by means of the finger or the handle of a scalpel, and then the cut margin of the vagina is caught with forceps and loosened sufficiently to allow it to be drawn together and sutured. A line of continuous suture is taken about one-quarter of an inch from the cut margin, and is like the ordinary purse-string suture, except that the first stitch, which is placed at the back, is carried around the vaginal artery, the suture drawn so as to leave both ends of even length in the vagina, the threads crossed, and then one side of stitches taken with one end and the other with the remaining end. In this manner the principal vessel is caught in a loop; and when the ends of the suture are drawn tight, not only is the vault of the vagina closed in, but also any tendency to hemorrhage from the vaginal artery is obviated.

A uterine stem¹ is then selected, according to the length of the cervix and size of the canal; with a soft uterus and large, easily dilatable cervix, one with wide thread is used, but with a cirrhotic organ one with a fine thread (even smooth) is preferable. The uterine stem is inserted and forced into place, after filling the cap with iodoform, either by simple pressure, or, in case one with a thread is used, by turning it up with a screw-driver; at the same time the cervix is held firmly by means of a pair of tenacula forceps fixed into the anterior and posterior lips. If the case is one of cervical cancer the stem must be inserted before any incision is made, and the contents of the uterus and infective parts tightly sealed by sewing the vagina to the edge of the metal cap with sutures taken through normal vaginal structure, sufficiently remote from the cervix to include all diseased tissue. One should then proceed as above described for non-infective cases. It is often advisable to tie a smooth stem into the cervix by means of one or more sutures, to prevent slipping.

The staff² is now inserted into the central cavity of the uterine stem and held in place by an assistant; the parts sponged clean and dry; a tampon of iodoform gauze packed into Douglas's pouch, under the peritoneum and between the cervix and bladder; and the ends of the purse-string-like suture

¹ The uterine stem is a device used to cork up the contents of the uterus, to give support and attachment to a staff used for elevating the uterus, and to serve as a guide for determining the position and limits of the cervix. It consists of a cap to cover the cervix and a central stem that fits into the canal, the whole being cast and turned from one piece of metal. The cap is concave on one side and convex on the other, has a groove in the edge for a director, and a number of T-shaped slots about the periphery for holding sutures. The central stem is smooth, or has a thread cut upon it, which serves to hold the instrument into the uterus when it is not fastened with sutures. Perforating the stem for the depth of an inch is a conical-shaped cavity, which receives the staff and holds it with a simple slip-joint.

² The staff is a steel rod bent on the curve of a prostatic catheter, except that the point is directed a little more outward and is made to fit the cavity of the stem.

drawn tight and tied, closing in the vault of the vagina below the cervix, gauze, and uterine stem, except for a small opening through which the staff passes. In exceptional cases, already mentioned, this careful toilet of the vagina is not only very difficult or impossible, but unnecessary and time-consuming, and should be omitted.

In these cases it is better simply to make a circular incision through the vagina, free the cervix, and then pack hard the whole vaginal cavity with sterile gauze. This elevates the uterus, pushes the ureters farther away to the sides of the pelvis, and serves as a guide during the dissection in the abdominal cavity. When this method is adopted the vault of the vagina can be closed in from the abdominal cavity. The patient is now placed in position for abdominal section with means ready for obtaining the Trendelenburg posture. The usual incision is made, and of variable length to meet the requirements of the case. The peritoneal cavity is opened at the upper angle of the wound, in order that before the opening is completed the position of the bladder may be determined and injury to it avoided. The incision is carried close to the pubes, to gain as much room as possible for working in the pelvis.

The contents of the abdomen are carefully inspected and the method of dissection determined. If the case is a simple enlarged uterus, with appendages approximately normal, the tumor is drawn out of the wound and to one side; the fold of broad ligament, including the tube and ovary of the other side, is put on the stretch, and a row of sutures passed below the ovary, from close to the side of the uterus to the free margin of the ligament, so as to include the ovarian artery. This line of sutures is inserted by means of a perineal needle; it is taken in the same manner as a shoemaker's stitch, but each stitch—which includes but a small amount of tissue—is drawn tight, and secured by taking a turn of the loose end of the suture about the other, so as to form a series of single knots. The uterus is then pulled over to the other side, and the remaining tube, ovary, vessel, and ligament secured in same manner. The ligaments are cut away above the ligatures, and between the points of their excision across the uterus in front and back about an inch above the attachment of the bladder anteriorly, and an inch above the cervix posteriorly, the peritoneal covering of the womb is incised. With the help of a scalpel handle, the bladder and peritoneum are now rapidly dissected up from the uterus in front until the line of former vaginal dissection is reached; the posterior layer of peritoneum is treated in the same manner: the sides of the uterus are freed from peritoneum as much as possible, when the lateral attachments, including the uterine artery, can be easily clamped and the organ cut away and removed. In cutting away the uterus keep as close as possible to that organ. During the dissection an assistant holds up the uterus firmly by means of the staff, which shortens and defines the neck and enables the operator to quickly and easily perform what is usually the most difficult part of the operation, the enucleation of the cervix. The gauze packing acts also as a guide, and

is of material assistance during this dissection. The uterine vessels are firmly ligatured with kangaroo tendon, the clamps removed, and all oozing of blood from the pedicles stopped by suturing. The anterior and posterior peritoneal flaps are brought together; the cut edges are turned in so as to bring the serous surfaces into contact, and the stumps containing the ovarian arteries are folded in at the angles so as to become extraperitoneal, the whole being closely united by a line of blind sutures, which when drawn tight are situated outside of the peritoneal cavity. All clots are removed by dry sponging, the abdominal wound closed layer by layer with animal ligature, and finally sealed with cotton and collodion.

Although ordinarily it is preferable to remove the ovaries, should one or both be found firmly bound down by old adhesions and in the condition of a small, hard mass, it is better to leave them *in situ* than to delay the operation by such time as is necessary for their removal. They will, as a rule, give rise to no further symptoms, as has been repeatedly demonstrated by vaginal hysterectomy, where often they must necessarily be left behind.

When a large multiple fibroid mass is encountered, the topography of the parts must be carefully studied, and the position of the bladder and (if possible) the ureters determined. If the growth forms with the uterus a single tumor, the same directions for operating as above described hold good; but where there are several distinct tumors, which are sessile in attachment and appear to have a very large pedicle, a sufficiently long cross incision is made through the peritoneal covering, and each tumor is enucleated as far as possible. By this means the pedicle will usually be found much smaller than expected, forming a part of the uterine attachment, and easily included in the clamp employed for securing the uterine vessels of the same side. Care must be taken in cutting and dissecting back of the peritoneal covering not to tear or injure the ureter, the position of which cannot always be recognized. If it is determined passing over the tumor, it should be dissected up and carried to one side with the overlying flap of peritoneum; but if it cannot be distinguished, any and all tissue which resembles it should be treated in the same manner; and as the clamps are applied prior to the final abscission, bear in mind the watchword of this operation, "*stick close to the uterus.*"

If, upon opening the abdomen, bladder, omentum, bowels, uterus, tubes, and ovaries present as a confused and conglomerated mass, firmly bound together by adhesions, the uterus can still be removed subperitoneally, as follows: A point is selected on the fundus of the uterus that is not obscured by adherent viscera, and a small cross-incision made through the peritoneal covering. The edges can then be picked up with forceps, the opening intelligently enlarged without injury to the adherent organs, and the peritoneum dissected from the uterus in every direction, well down on the sides, and sufficiently to admit of the easy adjustment of the clamps. The organ is cut away, the vessels secured, and the opening in the peritoneum closed as before, leaving the tubes and pelvis to drain *per vaginam*. In other

words, the uterus is removed by the combined method, with the same consideration for its surroundings which the French operators have when they extirpate by the vaginal method.

After the operation, shock is combated with saline rectal injections,—strychnine, morphine, atropine, caffeine, digitalis, nitro-glycerine, etc., as the case may require.

Six cases are added, illustrating the method of performing the operation.

MISCELLANEOUS.

Street Sanitation. (*National Board of Health Magazine*, June, 1895.)

By Professor W. F. McNutt.

Street sanitation is a subject of vast importance to the people whose lives are spent in cities. The insanitary condition of our streets is a constant menace to health; they are never clean, filth of many kinds is allowed to accumulate on them. The air we breathe is loaded with poisonous materials and noxious gases, while the noises and jars of heavy teams on stone streets tell very severely on the nervous system. No street made of poor material, badly laid, can be kept in a sanitary condition. A smooth, even surface is absolutely necessary for cleanliness; while a hollow in a street surface is a trap for rubbish and moisture, a generator of noxious gases and of destructive germs. Further, a street surface should be slightly convex in the centre, just sufficient to let the water find its way to the gutters and, if on level ground, there should be a slight fall from the middle of the block, each way. The fire-plugs in these level blocks, instead of being placed at the street corners, as is invariably the case, should be in the centre of the block. So situated the fire-plugs are available for street washing, which is an absolute sanitary necessity, and the water answers the double essential purpose of flushing the sewers. Very much of the decomposition that takes place in the sewers is entirely preventable by providing well-fitting screens to the traps. Streets made with stone blocks, the spaces between which are filled with sand, are necessarily insanitary; it is impossible to keep them clean. Decaying rubbish, manure from horses, which contains the tetanus bacillus, glanderous discharge from animals, sputa from consumptives, typhoid and cholera bacilli, etc., accumulate in the sand between the blocks and are constantly carried about by the wind. In some cities the garbage and refuse materials from back yards and stables, which contain the discharges from typhoid or cholera patients or the poisonous bacilli of scarlet fever, diphtheria, consumption, glanders, etc., are carried through the streets in open, leaky wagons, leaving a trail of filth and poison behind them. Nothing can be more criminally careless and disgusting than the manner of carting dead animals through the streets on open carts; many of them having died of contagious diseases, their

poisonous secretions are deposited on crowded thoroughfares. A smooth surfaced street kept well swept, sprinkled before sweeping, and frequently well washed, reduces the chances of street contraction of contagious diseases to a minimum. Every garbage cart should be built and kept constantly under the surveillance of the health department. All garbage should be destroyed by fire. Another source of street contagion lies in our street-cars and public carriages. Every car and carriage should be carefully cleansed and fumigated at least once a week. Bitumen is as yet the only known material with which to construct a street that is capable of being kept in a sanitary condition. It should be the duty of the health department to prevent, as far as possible, the noises,—i.e., air shocks and earth shocks. Nature has declared that rest and repose are essential restoratives and that no brain can do its best work that has not had a few hours freedom from air and earth shocks in every twenty-four hours. It is impossible to obtain this rest if the streets are paved with stone.

The Limits of the Physician's Duty to the Dependent Classes.
(*American Medico-Surgical Bulletin*, September 1, 1895.) By James W. Walk, M.D.

The physician, a man and a citizen, owes a great duty to civilized society, a duty which is conditioned upon his special knowledge. Acquainted as he is with the important laws of heredity and the reciprocal influence of mental and physical states, the responsibility rests upon him to lead the community in which he lives to a higher civilization and to better modes of life. He should be a teacher of the people, and not only by training men to cure disease but, pre-eminently, a teacher of preventive medicine, that department of our science now almost new, but destined to become its pride and glory.

The question of his duty in regard to medical charities is much less simple. Here also an obligation rests upon him, as, for instance, in cases of sudden accident, etc. But this is a very small part of the so-called "charitable" work now thrust upon the profession. It is the common notion that the doctor should treat, free of charge, all the dependents in his neighborhood, and should also give his services to both public and private institutions. Institutions supported out of the tax-rate are, in no proper sense, charities. Their cost is levied upon all the citizens, in proportion to their taxable wealth, and there is no call for any one to serve them gratuitously. All others are paid for their services, but the physician is supposed to act from some principle not applicable to other sensible men.

Outside of the institutions supported by public taxes comes the yet wider field of the private charities. In these institutions it is right and fair that physicians should make contributions to them in service, if they see fit, but this right has its limitations. Free medical service to come within the definition of a wise and judicious charity should be rendered to those only who are unable to pay for it. To give it to others involves two wrongs:

the first, to the younger men of the medical profession who ought to have turned over to them those patients who are able to pay only small fees; the second, to the community, by the encouragement of pauperism and the undermining of independence.

Twelve years ago a somewhat thorough investigation of the dispensary system of the city of Philadelphia was made, and quite recently the same ground has been traversed with a similar result by a well-known physician of that place. In thirty-two free dispensaries there were treated in one year one hundred and sixty-one thousand and twenty-nine cases, which was about twenty per cent. of the entire population of the city, or one-fifth of all the people. Carefully compiled statistics show that, in Philadelphia, the actual pauper class does not exceed one per cent. of the population. If medical men do all of this vast work from 'charitable motives, certainly they need to be converted to a more judicious and discriminating doctrine of charity. If this service is rendered from selfish motives, the advantages derived from this free service have been greatly over-estimated. No medical man should indulge the pleasing delusions that the patients he treats at the dispensaries suppose him to be doing a noble and philanthropic act, and putting them under a corresponding obligation. In their view, the accommodation is generally the other way.

The valuable experience that may be gained by dispensary practice is often lost from lack of time to make a really scientific examination.

If, then, the duty of the physician to the dependent classes and also considerations of self-interest demand the restriction of free medical service, it is obvious that the existing system should be radically changed. Efforts made to restrict free aid to the indigent have, thus far, in almost every instance, failed through the opposition of the physicians themselves, who desire to have largely attended clinics. The very enormity of the evil may, however, lead to a powerful revulsion of sentiment, when means will readily be found to discriminate between the poor and those able to pay for treatment.

Obliteration of the Appendix Vermiformis. (*University Medical Magazine*, September, 1895.) By George A. Piersol, M.D., of Philadelphia.

The partial or total occlusion of the vermiform appendix due to retrogressive but non-pathological processes has been noted by a number of authors, but to Ribbert and Zuckerkandl we are indebted for extended and systematic observations.

Ribbert examined four hundred appendices, and found in ninety-nine, or twenty-five per cent., either partial or complete obliteration of the lumen, accompanied by marked alterations in the mucous and submucous coats. Of two hundred and thirty-two appendices examined by Zuckerkandl, in fifty-five, or 23.7 per cent., the involution processes were established. Evidences of obliteration are rarely found in the early years of life, but after the sixtieth year they are present in over half of the cases.

The appendix attains its fullest structural development between the tenth and the twentieth years. During this period the wall of the diverticulum consists of the four coats common to the gut-tract. The glands of Lieberkühn and the lymph-follicles are very numerous in the mucosa.

The writer thinks, with Zuckerkandl, that changes within the submucosa inaugurate the processes leading to the retrogression of the appendix and precede the alterations affecting the mucous membrane. These changes consist of a marked increase in the thickness of the submucosa, associated with a conspicuous aggregation of fat-cells. Later, the adipose tissue largely disappears, and the submucosa becomes contracted to a thin, fibrous layer.

Retrogressive changes in the mucosa consist of atrophy of the lymphatic follicles and of the glands of Lieberkühn, with a subsequent invasion by lymphoid cells. Finally, the opposed surfaces of the mucosa may unite, and all traces of the lumen may become effaced.

From the great frequency of these changes, the absence of indications of inflammatory action, the typical sequence of the changes, and the well-known tendency of similar rudimentary organs to retrogressive change, the conclusion arrived at by Ribbert, Wölfler, and Zuckerkandl, and accepted also by Berry, that these changes must be regarded as phases of a process of involution, seems the only one tenable.

The following advantages are claimed for imbrication:

1. A large, strong flap of any needed size to fill the internal ring.
2. Triplicate layers of aponeurosis.
3. Interlocking of layers giving broad surfaces of union.
4. Shortening of anterior as well as posterior wall of canal, making them mutually supporting and relieving tension on deep sutures.
5. Cord amply protected.

BOOK REVIEWS.

PATHOLOGY AND TREATMENT OF DISEASES OF THE SKIN, FOR PRACTITIONERS AND STUDENTS. By Moriz Kaposi, Professor of Dermatology and Syphilis and Chief of the Clinic and Division for Skin Diseases in the Vienna University. New York: William Wood & Co., 1895.

This translation of the last edition, the fourth presumably, of the "*Pathologie und Therapie der Hautkrankheiten*," of Professor Kaposi, makes accessible for the first time in English the well-known treatise of the distinguished Viennese dermatologist, who, as the successor of Hebra, is easily the first of those who compose the so-called Vienna School of Dermatology. Although text-books upon diseases of the skin have been multiplying of recent years with increasing rapidity, this is a welcome addition to the list, since the author's training, enormous experience, and eminent ability peculiarly fit him for the task of writing a text-book. The book is an eminently practical one, and but little space is given to matters of pure theory. The

opinions expressed, often rather dogmatically, it is true, are largely the result of the author's personal experience and observation in a field rich in material for study. In a few instances these opinions are at variance with those held by other equally eminent authorities. Varicella is declared to be identical with variola, an opinion which will find few supporters outside of Vienna. Paget's disease is declared to be but the accidental concurrence of eczema and carcinoma; and lupus vulgaris, concerning the tubercular nature of which the rest of the world is agreed, is not held to be a cutaneous tuberculosis, the presence of tubercle bacilli being regarded as accidental. Dermatitis herpetiformis, which the English, French, and American dermatologists have accepted as a distinct nosological entity, is dismissed with a few words as properly belonging to pemphigus.

The treatment of the various cutaneous diseases is largely—we had almost said, exclusively—local; internal medication plays a very subordinate part, in the author's opinion, in the treatment of diseases of the skin. While it is doubtless true that external remedies are often sufficient, yet we believe internal medication to be more useful than the reader of this book would be led to think. The translation is a free, rather than a literal one, and is in the main satisfactory; in a few instances, however, the translator has failed to render the German into its exact English equivalent. In conclusion, we only wish to add that this treatise, which has long held an enviable position, is one of the best in any language, and the translator has performed a real service in making it accessible to those who are unable to read it in the original.

M. B. H.

THE URINE IN HEALTH AND DISEASE, AND URINARY ANALYSIS, PHYSIOLOGICALLY AND PATHOLOGICALLY CONSIDERED. By D. Campbell Black, M.D., L.R.C.S. (Edin.), F.F.P. and S. (Glas.), Professor of Physiology in Anderson's College Medical School; Physician to the Glasgow Public Dispensary (Department for Kidney and Urinary Diseases), etc., etc. Philadelphia: Lea Brothers & Co., 1895.

In the preparation of this book the aim of the author has been to combine conciseness with a treatment of the subject from a clinical and practical stand-point.

Dr. Black's reputation, as a careful and exhaustive writer on Bright's disease, renders criticism of the subject-matter unnecessary, and it need only be said that he has included in the volume under consideration the latest information to be found in this branch of medical science.

Part I. composes the anatomy and physiology of the healthy kidney, and the general properties of the urine.

Part II. treats of the normal elements and their chemical and physical characteristics. The section on urea and uric acid is especially good.

Part III. deals with the abnormal constituents, their chemical tests, pathological significance, and therapeutic indications. The lists of tests for albumin and glucose are very complete, and the fallacies of the principal tests are given. Transitory albuminuria is considered in an admirable manner, but the author's treatment of the subject of tube-casts seems too short to do the matter full justice, and entirely omits the microscopic technique, that would seem especially important in this connection.

The last three chapters include articles upon sediment, chemical analysis of calculi, and medicaments found in the urine.

It may appear that the practical value of the work is occasionally sacrificed to its completeness, in that too much attention is paid to rare elements and those of little clinical interest, and not enough to subjects of more vital importance to the practitioner. However, the book will be very useful, as a means of reference to those whose time is too much occupied to consult the extensive literature upon the subject.

J. D. S.

PATHOLOGY AND THERAPEUTICS OF DOMESTIC ANIMALS. By Dr. Friedberger, Professor of Veterinary Medicine in the School at Munich, and Dr. Fröhner, Professor of Veterinary Medicine in the School at Berlin. Translated from the most recent edition, with Annotations by Professor W. L. Zuill, M.D., D.V.S., late Professor of Surgery and Obstetrics in the Veterinary Department of the University of Pennsylvania; Member of the Academy of Natural Sciences of Philadelphia; Member of the United States Veterinary Medical Association; Member of the Philadelphia County Medical Society. Together with the Notes of the French Translators, and Selections from those of Professor Trasbot. In two volumes of about 600 pp. each. Price, \$6 per volume, net (cloth binding). Philadelphia: William J. Dornan.

The translation of this admirable work will be welcomed not only by the veterinarian, but also by the student of comparative medicine unfamiliar with German. Friedberger and Fröhner are at the present time the foremost scientists in veterinary medicine in Germany, as well as the leading authorities in the world. How well this work is received is shown by the fact that it has been translated into Russian, French, and English, and has been adopted as the standard text-book in France and Russia. Professor William L. Zuill deserves the greatest credit for his elaborate and praiseworthy translation. He should feel fully compensated by the everlasting gratitude of the English-speaking veterinarians.

The first volume is in five sections, and comprises—I. Diseases of the Digestive Organs; II. Diseases of the Urinary Organs; III. Diseases of the Genital Organs; IV. Diseases of the Heart and Larger Blood-Vessels; V. Diseases of the Skin. Special mention deserves the chapter on colic, which is the best article ever written in any language on the subject. The description of toxic gastro-enteritis in its various forms is most exhaustive and up to date. The chemical analysis and the physical examination of the urine and the diseases of the kidney are admirably described in the second section. The description of heart-diseases is classic.

We are sorry to note that the valuable references to current literature are omitted from the translation, the explanation given in the preface being no excuse for the omission. They form a most valuable feature of the original, and could have been added without materially increasing the size or cost of the work.

R. J. F.

PRACTICAL DIETETICS, WITH SPECIAL REFERENCE TO DIET IN DISEASE. By W. Gilman Thompson, M.D., Professor of Materia Medica, Therapeutics, and Clinical Medicine in the University of the City of New York; Visiting Physician to the Presbyterian and Bellevue Hospitals. 8vo, pp. 800, illustrated. Cloth, \$5; sheep, \$6. New York: D. Appleton & Company.

This work occupies a place in practical medicine that has long been vacant, and comes to us to supply long-felt wants none too soon. The importance of dietetics in the treatment of disease is recognized by every one practising the healing art. And every one so engaged has often been greatly disappointed, on consulting the text-books concerning a matter of diet, to read "that a light but easily assimilated diet should be prescribed," or that "hydrocarbons should be taken, and carbohydrates should be avoided." The books of detachable diet-lists which have been published from time to time are unsatisfactory, but their usefulness is demonstrated by the ready sale with which they have met. The work under consideration replaces these lists and gives diet-tables under each disease, with practical hints on the choosing and combination of different articles found under their appropriate headings. Chapters are devoted respectively to diet in infectious diseases; diet in diseases of the respiratory system; diet in diseases of the circulatory system and blood; diet in diseases of the urinary system; diet in diseases of the alimentary canal; diet in diseases of the in-

testines; diet in diseases of the liver; diet in diseases of the nervous system, and diet in skin diseases. Special mention should be made of the admirable practical consideration of the diet in tuberculosis. The section on diet in typhoid fever contains a paragraph on the relation of intestinal antiseptics to diet. In the chapter on diet in disease of the alimentary canal a section is devoted to a hasty consideration of the examination of the stomach contents, which is followed by a section giving directions for test-meals. The diet for dyspeptics is treated of at length, while diarrhœas and constipation receive thorough consideration. A chapter is devoted to the diseases which are most influenced by diet, such as obesity, rheumatism, diabetes, scrofula, rachitis, scurvy, and hemorrhagic purpura, in which a summary of the different courses of treatment for these different conditions, as recommended by various authors, is given. Diets are given for surgical cases after the various operations. The rations of the army are given, as well as the dietaries of various hospitals. A valuable chapter is that on infant feeding. While the practical part of applied dietetics is treated of so fully, the theoretical side is not neglected, nor is it presented in such obscure technical language as to be ambiguous. The composition of foods, the economic value of foods, and a consideration of the various food materials occupy the first part of the book, together with a consideration of the various stimulants, beverages, and condiments. Food preparation and preservation, the quantity of food required, conditions especially affecting digestion, and the administration of food for the sick receive ample and lucid consideration. The volume is of distinct practical value, and the author is to be congratulated upon presenting to the profession a work which will answer all mooted questions upon the subject of which it treats.

J. M. S.

BOOKS RECEIVED.

F. A. DAVIS CO., PHILADELPHIA.

ANNUAL OF THE UNIVERSAL MEDICAL SCIENCES, issue of 1895, edited by Charles E. Sajous, M.D., and seventy associate editors, assisted by over two hundred corresponding editors, collaborators, and correspondents. Illustrated with chromolithographs, engravings, and maps. In 5 volumes. Sold only by subscription. Price \$5.00, in cloth.

LEA BROTHERS & CO., PHILADELPHIA.

GRAY ON NERVOUS AND MEDICAL DISEASES. By Landon Carter Gray, M.D., Professor of Diseases of the Mind and Nervous System in New York Polyclinic. New (second) edition. In one octavo volume of 728 pages, with 172 engravings and 3 colored plates. Cloth, \$4.75; leather, \$5.75.

TAYLOR ON THE PATHOLOGY AND TREATMENT OF VENEREAL DISEASES. By Robert W. Taylor, A.M., M.D., Clinical Professor of Venereal Diseases in the College of Physicians and Surgeons, New York. In one octavo volume of 1002 pages, with 230 engravings and 7 colored plates. Cloth, \$5.50; leather, \$6.50. 1895.

W. B. SAUNDERS, PHILADELPHIA.

SENN'S PATHOLOGY AND SURGICAL TREATMENT OF TUMORS. By N. Senn, M.D., Ph.D., LL.D., Professor of Practice of Surgery and Clinical Surgery, Rush Medical College.

AN AMERICAN YEAR-BOOK OF MEDICINE, edited by Dr. George M. Gould, editor of the Medical News. (In preparation.)

WILLIAM WOOD & CO., NEW YORK.

LOOMIS'S TEXT-BOOK OF PRACTICAL MEDICINE. Designed for the use of Students and Practitioners of Medicine. By Alfred L. Loomis, M.D., LL.D., Professor of Pathology and Practical Medicine in the Medical Department of the University of the City of New York; Visiting Physician to Bellevue Hospital, etc. Revised and enlarged, with two hundred and seven illustrations and one chromolithographic plate. Eleventh Edition. 1134 pages. Price, Cloth, \$6.00; leather, \$7.00.

P. BLAKISTON, SON & CO., PHILADELPHIA.

CLINICAL LECTURES ON DISEASES OF THE NERVOUS SYSTEM, DELIVERED AT THE NATIONAL HOSPITAL FOR THE PARALYZED AND EPILEPTIC, LONDON. By W. R. Gowers, M.D., F.R.S., Physician to the Hospital; Consulting Physician to University College Hospital. Pp. 279. Price, \$2.

ITEMS OF INTEREST.

THE death of Louis Pasteur, chemist and biologist, on the 28th of September, 1895, from apoplexy, leaves Virchow *facile princeps* as the greatest survivor of those workers who wrought such marvellous changes in medicine during the middle decades of the present century. For the last few years he had not been actively engaged in laboratory work, often being absent from the Pasteur Institute at Paris for months at a time. His interest in the work there, however, never ceased, and it was one of his greatest pleasures to entertain at his own home some of the younger workers, in order to discuss the investigations which they were carrying on in his laboratory. The refusal of Pasteur to accept the Prussian order of the black eagle last summer gave rise to considerable newspaper talk, and was apparently due to his intense patriotism, which made him extremely popular among his fellow-countrymen. While not a physician himself, his discoveries made possible the achievements of Lister, and to him we really owe the foundation stones of antiseptic and aseptic surgery, and of our knowledge of the infections, fermentation, immunization, and preventive medicine. It is often stated that the scientific man is one who works for the love of science and not for any good which may result from his labors. Pasteur was not such a one; eminently practical in all his studies, he knew full well that the best method of avoiding an evil is to find its cause. Hence, the great monetary value of his work in connection with fermentation, sterilization, anthrax, and diseases of silkworms. The work which first drew attention to him as an original investigator was upon crystallography, in regard to the allied compounds of tartaric acid, and on polarization of light to hemihedrals in crystals. In 1857, Pasteur proved that fermentation is a physiological function of

The Death of
Louis Pasteur.

the yeast-cells, thus showing the correctness of the vitalistic or so-called germ theory of fermentation. He was the first one who produced fermentation on artificial nutritive media, consisting of water, sugar, ammonia, and ashes, mixed with a minimum of air-dust or hay-dust, and thus showed that organic substances are not necessary for the production of fermentation and putrefaction, as long as the micro-organisms can procure their carbon, nitrogen, and mineral salts. Next he was brought to experiment upon pure cultures of organisms. While Pasteur was able to prepare an antivaccine to hydrophobia, even his fertile genius and that of those associated with him have been unable to isolate the organism which gives rise to the symptoms. The many Pasteur institutes created in France and in different countries will probably prove the greatest factor in extending his renown to future generations.

We sincerely trust that the many friends of the *Index Medicus* will not suffer this the most valuable contribution to medical literature to cease its existence from lack of support. On many visits to the library of the Medical School at Paris, the *Index Medicus* and the *Index Catalogue* of the Library of the Surgeon-General's Office, United States army, now completed, were always found to be in use. A self-constituted committee from Philadelphia, consisting of Drs. William Pepper, S. Weir Mitchell, H. A. Hare, De F. Willard, J. C. Wilson, H. C. Wood, J. William White, W. W. Keen, George M. Gould, John H. Packard, E. Laplace, and John B. Roberts, has agreed to appeal to the literary workers of the medical profession throughout the country to unite with them in reviving the *Index*. Each of these gentlemen has agreed to subscribe to the journal for a period of five years. It requires about \$5000 annually to publish this monthly, and the publisher, Mr. George S. Davis, and the former editors, Drs. Billings and Fletcher, are willing to take up the work again if two hundred subscribers at \$25 per year can be secured. The nature of this journal is such that it can never obtain a large subscription list, and every one who has ever worked with it should, therefore, consider himself a committee of one to secure a new subscriber. It should not be a difficult matter to raise at least \$2000 from the advertisements, although it would be better if they could be dispensed with.

The Philadelphia County Medical Society, at their meeting held September 11, resolved to subscribe for two copies, and the Syracuse Academy of Medicine has taken one copy. From October 26 to November 5, sixty-two new names were received by the publisher, the total number of subscribers at that time being 174. This is so near the 200 mark that there can be but little doubt of the reappearance of the *Index*. Earnest efforts are being made also in Great Britain, through the influence of the *Lancet* and the *British Medical Journal*, to secure a list of subscriptions from that country.

In Holland, the papers for the patent of a new automaton¹ have just been issued, the use of which may rival to a certain extent even the dangers of the much-abused free dispensary service or the "counter-prescribing of the druggist. The apparatus consists of the figure of a pedantic-looking doctor, in the body of which are to be found numerous slots labelled with the names of various diseases. The get-well-quick-and-cheaply patient suffering, we will say, from headache, merely drops his coin into the proper opening and receives a powder which is warranted to be an infallible remedy for all varieties of cephalalgia. For stomachic troubles the ever-ready "bitters" are at hand.

For scientific and economic reasons, Boyce and Herdman,² of Liverpool, have made investigations relating to the life conditions of the oyster under normal and under abnormal environment. The effects upon the oyster of water contaminated by sewage and by normal and typhoid fæces are noted; also the fate of the typhoid organism in the oyster, and the length of time required to render infected oysters harmless. The methods employed include four different series of observations. In the first series a portion of the oysters were sunk five fathoms deep in the bay, others were deposited in a shore pool, but in clean water, and still others were placed in close proximity to a drain-pipe. A second series were conducted in the laboratory,—oysters being placed in stagnant sea water, in aerated sea water, and in that in which the salinity was gradually reduced. Another series were fed with different kinds of food, such as living protophyta and protozoa, oatmeal, flour, sugar, earth, etc. A fourth series were placed in sea water to which either healthy fæcal matter, typhoid stools, or pure cultures of the typhoid bacillus were added. These experiments demonstrate the beneficial effects of aeration by the addition of air only, or by change of water by tidal currents or otherwise. Oysters can live for long periods in sewage-contaminated water or water containing fæcal matter. Protophyta and protozoa are the best food for oysters. Those fed on oatmeal and flour after a time sickened and died, while the exceedingly harmful action of sugar is noted. A bacteriological examination of the water from the pallial cavity and from the rectum of the oyster showed but few colonies of micro-organisms in oysters laid down in the open water of the bay, while in those placed in proximity to the drain-pipe the number was enormous. Oysters grown in water infected with the typhoid bacilli showed no apparent increase of the bacilli, but these could be identified in cultures made from the water of the pallial cavity and rectum fourteen days after infection. The typhoid

¹ Korrespondenzblatt der ärztlichen Kreis- und Bezirksvereine im Königreich Sachsen, October 15, 1895.

² Science, October 11, 1895.

bacillus will not flourish in clean sea water, and it would seem that oysters previously contaminated with sewage could be freed of pathogenic organisms or their products by carefully subjecting them to a natural process of cleaning in unpolluted water.

Dr. W. Murray¹ submits two cases of the power of nitrate of silver to cure epilepsy, the price of the cure being argyria,—in one of the cases, however, so mild as to be unnoticed by the patient. He asks if a patient stained with nitrate of silver has ever been posted. Dr. C. Frommann (Virchow's Archives, 1859, vol. xvii. p. 135) describes a case of argyria in which the intestine, liver, kidneys, spleen, skin, etc., were carefully examined microscopically. In this case the silver nitrate was used in the treatment of epilepsy. In Riemer's case (Arch. d. Heilk., 1875, vol. xvi. p. 296) the drug was used for tabes. Both of the articles are well illustrated. v. Kahlden has prepared and studied some beautiful sections from rabbits fed with silver nitrate for seven months (Ueber die Ablagerung d. Silbers in d. Nieren, Beitr. v. Ziegler, vol. xv.).

Formalin, or formic aldehyde, has many uses at the present time. The latest idea is to prepare it in the form of vapor, by the incomplete combustion of wood spirit. This is accomplished by means of a spiral of platinum wire wound round the wick of an ordinary spirit-lamp or of a specially constructed lamp, so that the spiral projects half an inch or so above the top of the wick. Combustion continues to go on after the flame has been blown out, the wire remaining incandescent while the spirit undergoes a change from alcohol to aldehyde,—in the case of ethyl alcohol to acetic aldehyde, and in that of methyl alcohol to formic aldehyde. The vapors of formalin are said to have no injurious effect upon furniture and metal fittings. As this method of preparation would probably be expensive, it would have no advantage over the simple evaporation or boiling of the ordinarily prepared liquid.

The statement, quoted by Dr. Shattuck in his article on "Tuberculous Peritonitis," in the last number of the INTERNATIONAL MEDICAL MAGAZINE, from Flint's "Practice of Medicine," edited by Dr. F. P. Henry, that peritoneal tuberculosis is invariably fatal, is to be found in the last edition. In the chapter on pleuritis (p. 43), the following interpolation by the reviser has, however, been inserted: "The fact that a patient recovers from a

Has a Case of Argyria ever been posted?

The Vapor of Formalin as a Disinfectant.

The Cure of Tuberculous Peritonitis.

¹ Lancet, September 21, 1895.

pleurisy does not necessarily indicate that it is non-tubercular, for tubercular processes in serous membranes, such as the peritoneum and pleura, are often remarkably benign."

The following items,¹ taken from an account paid to the public executioner during the history of *vieux Paris*, have been brought to light in connection with the discussion now going on in France in regard to the abolition or to the changing of the character of the death penalty.

Executioner's
Fees in ye Olden
Time.

	Livres.
To cooking a malefactor in oil.....	48
To quartering while living.....	30
To affording a criminal passage from this life to the next world by the sword	20
To breaking the body upon the wheel.....	10
To fixing his head upon a pole.....	10
To cutting a man into four pieces.....	36
To hanging a culprit.....	20
To laying out the corpse.....	2
To impaling a living man	24
To burning a sorceress alive.....	28
To flaying a living man.....	28
To drowning an infanticide in a sack.....	24
To dumping a suicide along the road.....	20
To torturing.....	4
To applying the thumbscrew.....	2
To applying the buskins.....	4
To giving the Gehenna torture.....	10
To putting a person in the pillory.....	2
To flogging.....	4
To branding with a hot iron.....	10
To cutting off the tongue, the ears, or the nose.....	10

The Philadelphia Academy of Medicine have made the announcement that the second quinquennial prize of one thousand dollars, under the will of the late Samuel D. Gross, M.D., will be awarded January 1, 1900. The conditions annexed by the testator are that the prize "shall be awarded every five years to the writer of the best original essay, not exceeding one hundred and fifty printed pages, octavo, in length, illustrative of some subject in surgical pathology or surgical practice, founded upon original investigations, the candidates for the prize to be American citizens." It is expressly stipulated that the successful competitor, who receives the prize, shall publish his essay in book form, and that he shall deposit one copy of

¹ Le progrès médical, August 3, 1895.

the work in the Samuel D. Gross Library of the Philadelphia Academy of Surgery. The essays, which must be written by a single author in the English language, should be sent to Dr. J. Ewing Mears, 1429 Walnut Street, Philadelphia, before January 1, 1900.

NOTE TO CONTRIBUTORS.

AUTHORS will receive liberal compensation for accepted articles upon publication; or reprints, if stated on the manuscript, will be furnished in lieu of the honorarium. It is distinctly understood that all articles appearing as original matter are for our exclusive use, and are not to be reprinted or to appear in any other publication excepting the Transactions of the society before which the paper may have been read. Illustrated papers are especially desired.

All matters of business, as well as subscriptions, should be sent to the INTERNATIONAL MEDICAL MAGAZINE COMPANY, 716 Filbert Street, Philadelphia.

Manuscripts, exchanges, and books for review should be addressed to the Editorial Office, 3709 Spruce Street, Philadelphia.

INTERNATIONAL MEDICAL MAGAZINE.

Vol. IV.]

DECEMBER, 1895.

[No. 11.]

ORIGINAL COMMUNICATIONS.

OBSERVATIONS ON THE MARROW OF THE BONE AND THE SPLEEN IN A CASE OF LEUKÆMIA.¹

BY JOHN GUITÉRAS, M.D.,

Philadelphia.

IN the following paper attention will be called to some observations made upon the structural changes in the marrow and in the spleen and to the bearing they may have on the process of cytogenesis. Unfortunately, it has not been possible to study this process in the normal organs from the point of view suggested in the paper.

The case was one of leukæmia, treated in the Philadelphia Hospital under the care of Dr. William E. Hughes. The case was diagnosed as one of splenic and myelogenic leukæmia.

The notes of the *post-mortem* are as follows:

Isaac L., aged fifty-five years, white, male, native of England, admitted to the Philadelphia Hospital, December 11, 1894; died February 5, 1895. Post-mortem made sixteen hours after death.

Pathological Diagnosis.—Anæmia; hyperplasia of the spleen; lymphoid marrow of the bones; lymphoid infiltration of the liver and the kidney.

Body of a very emaciated man. Surface of the body considerably discolored by freezing, but showing evidences of a slight yellow discoloration. Round, superficial ulcers are found over the external malleoli.

Abdominal Cavity.—The liver projects beyond the edge of the thorax four centimetres in the right mammary line, ten centimetres in the median line, and four and a half centimetres to the left of the same. The spleen projects nine and a half centimetres in the left mammary line, and extends two and a half centimetres beyond the median

¹ Read before the Association of American Physicians, 1895.

line. The left lobe of the liver overlaps the spleen one centimetre. The appendix projects inwardly, and then bends down over the psoas muscle into the pelvis.

Thoracic Cavity.—The lungs are free and small, and the pleural cavities are empty. The costal pleura is marked by minute spots of dark pigment in the intercostal spaces. A few of these are found also in the mediastinal pleura. On opening the pericardial sac a dense band of adhesion is found in front. The right ventricle is covered by a large, white fibrous patch. The rest of the visceral pericardium shows evidences of myxomatous change.

Heart.—Both ventricles are flabby. The left cavities contain a small amount of liquid, pale, rose-colored blood and some grayish coagula. The mitral orifice admits two fingers. The right cavities contain a large, soft, grayish clot and a small amount of liquid blood. The tricuspid orifice admits with difficulty three fingers. The right auricle is somewhat dilated. The other cavities are normal in size. The mitral valve is slightly thickened and presents a few opacities. The other valves are normal. The apices of the papillary muscles show some evidences of fibroid change. The aorta presents some patches of atheroma near the valves. The myocardium presents a brownish color. The orifice of the pulmonary artery measures ten and a half centimetres in circumference. The pulmonary valves appear somewhat large. The aortic orifice measures nine and a half centimetres in circumference. The heart weighs three hundred and ten grammes.

Left Lung.—This presents extensive anthracosis. The surface of section is otherwise normal. The bronchial glands are of normal size, and some of them are slightly indurated and surrounded by a thickened capsule. Others are rather soft. They are all black in color. The lung weighs four hundred and sixty grammes. The right lung is similar to the left. The bronchial mucous membrane of both lungs is somewhat swollen, and presents a marble discoloration of a purplish and gray color. The organ weighs six hundred and eighty grammes.

Spleen.—The splenic vein flattened out measures one and three-tenths centimetres in diameter, and the artery half a centimetre. The organ is large, dense, and irregularly tongue-shaped, the upper extremity being thick and rounded and the lower extremity presenting a flattened edge. It presents a large concavity towards the hilum. There is a large notch on the posterior border and a smaller one on the anterior. The organ measures twenty-five centimetres in length, fourteen in width, and ten in thickness. At the upper end there is some thickening of the capsule. The latter presents a pale-magenta color. The surface of the section is smooth, and shows the color of cherry wood. There is no prominence of the Malpighian bodies. Towards the cortex the structure is slightly translucent, and very minute areas of a darker color and slightly translucent are seen throughout the substance. There is no prominence of the trabecula. The organ weighs eighteen hundred and ten grammes.

The *suprarenal bodies* are soft and dark in color. The connective tissue around them shows evidences of mucoid change.

The *left kidney* is rather soft, the capsule is easily removed, and the surface is smooth and grayish brown in color. The surface of section shows a marked contrast between the pyramids and the cortex. The former are of a rose-red color, and the latter is gray. The structure of the latter is not clear. The organ weighs one hundred and forty-eight grammes. The right kidney presents a similar appearance to the left, and weighs one hundred and forty-eight grammes. They both show some reduction of the cortex. The color of the latter may be compared with that of dark coffee and milk.

The *pancreas* is somewhat firm, and presents a pale yellowish-gray color. It is otherwise normal.

The *stomach* is rather contracted. The mucous membrane is smooth and presents a pale rose-color.

The *duodenum* is normal. The common duct is patulous. The bile is fluid and of a pale-yellow color.

The *liver* is rather soft, and the capsule presents a few patches of thickening. The color is of a rather pale brown, presenting in some portions minute mottlings of a yellowish-gray color. The organ measures transversely twenty-five centimetres.

The right lobe measures antero-posteriorly twenty-two centimetres, and the left lobe nineteen. The right lobe is nine centimetres thick. The surface of section is smooth, brown, and marked by minute grayish areas in the periphery of some of the acini. The organ weighs nineteen hundred grammes.

The *mesentery* contains a small amount of fat showing mucoid change. The mesenteric glands are very slightly enlarged, of normal consistency, and some of them on section present a marbled appearance of white and rose-color. The inguinal glands are similarly affected. No change is found in other lymphatic glands.

Intestines.—The *valvulæ conniventes* are prominent and œdematous. In some places they are stained with bile, and in others they show evidences of congestion. The large intestine is normal.

The *abdominal aorta* is large and presents a few patches of atheroma, especially in the lower portion. It contains puriform clots. The thoracic duct presents a normal calibre and rather thin walls.

The *testicle* is rather soft, and presents striæ of a yellowish-brown and rose-red color.

The *bladder* is normal.

Bones.—The sternum presents a brownish-purple and pulpified marrow. The costal cartilages present, on section, a marked translucent brownish central area. The medulla of the femur is rather soft and dark purple in color.

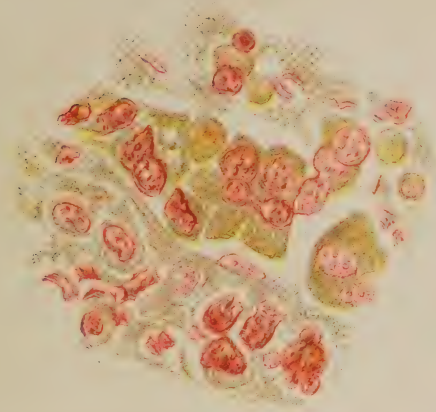
The sections of the marrow and of the spleen that have received careful attention in this case were cut from small pieces that were placed for two hours in Müller's fluid, then washed, fixed in Fleming's, hardened in alcohol, and cut in celloidin. The methods of staining were safranin, Benda's hæmatoxylin stain, which was used for tissue that had been hardened in Müller's fluid, Biondi's fluid, and a stain of safranin, orange G, and methyl-blue.

Any one undertaking the study of these two organs recognizes at once the difficulty of the problem before him. The variety of opinions expressed as to the nature of the cellular elements is rendered more confusing by the variety of methods that are suggested for their study. No attempt will be made in the present paper to enumerate and discuss these opinions. In the bone-marrow especially we are confronted with cells that are diplasmatic to a marked degree. We have here in the loose reticulum, which has a tendency to arrange itself in the form of tubes, cells of varying size. Some of them contain fat, others hæmoglobin, others eosinophile granules, others present an osseous protoplasm, and others the colorless protoplasm of the amœbocytes. A rather ineffectual attempt to dissociate these cells is based upon peculiarities of the nucleus, even before the protoplasm becomes characterized by the different forms of metaplasma. The manner of division of the nucleus is insisted upon as an important feature in the differentiation of these cells. It is very probable, however, that different forms of nuclear division may be found in cells that are not fundamentally distinct from one another.

In the present case the lymphoid reticulum of the bone-marrow is found slightly thickened, and spaces are crowded with a variety of cells. These may be seen in Figs. 1, 2, and 3, accompanying the present paper. Attention is especially called to Figs. 1 and 2, where different forms of nuclear division and a variety of cells are shown. Nowhere in the marrow has any evidence been found of the formation of red blood-cells. There are, undoubtedly, numbers of cells that present the nuclear features that are said to be characteristic of erythroblasts, but it appears that they become overgrown with protoplasm, or may present evidences of nuclear cell-division without being able to form red blood-globules. The protoplasm of such cells frequently shows unmistakable evidence of the presence of hæmoglobin. In Fig. 1 a widely-dilated endothelial channel is shown filled with such cells. Their nuclei present the indirect forms of segmentation of the nucleus that have been described by Arnold. There are evidently no karyokinetic figures. In Fig. 2 a large marrow-cell is seen to the left, presenting a similar polymorphous arrangement of the nucleus. The nucleus of this cell presents a small amount of chromatin and a distinct nuclear membrane. To the right of this we find an erythroblast which shows swelling of the protoplasm and increase in the amount of chromatin and an attempt at mitotic division of the same. Such cells are frequently found in the marrow in the present case, and undoubtedly find their way into the circulation and swell the number of leucocytes and nucleated red blood-cells. The next cell to the right is a resting-cell of the same kind as the one to the left, but in which no fragmentation is taking place. We have, finally, to the right of this a large fat-cell. In fact, in these wide channels of the lymphoid marrow we may find cells in all stages of direct nuclear fragmentation and varying forms of chromatolysis, and cells varying in size from the small round erythroblasts (that will be described further on) to the large cells shown in Figs. 1 and 2. With the exception, perhaps, of the true erythroblasts, these cells may be considered as interchangeable, and even the erythroblasts appear to be subject to such changes as may bring about their conversion into the form of cell described as leucoblast,—that is, their nucleus may become gradually poorer in chromatin, and will assume by degrees the loose reticulated appearance characteristic of the larger cells.

In regard to the spaces where these cells are to be found in the bone-marrow we note the fact that many of them are not lined with endothelial cells. Some of them, on the other hand, present the endothelial lining of capillaries. These endothelial cells show no evidences of nuclear cell-division. They are oval in shape, poor in chromatin, and project slightly into the lumen of the vessel. These endothelial channels appear to be surrounded by channels that are not lined with endothelial cells. It is in these periendothelial channels that we shall find, later on, in the spleen, a large number of erythroblasts engaged in the process of red blood formation. In the marrow of the bone, however, they do not gather in these localities,

FIG. 1.



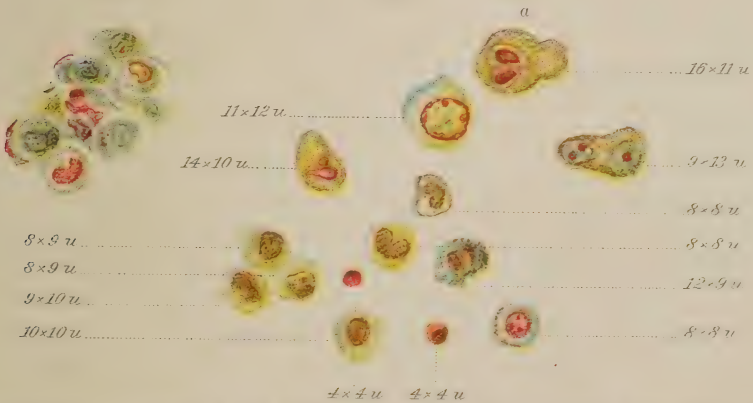
Bone-marrow of leukaemia; large irregular nuclei, with haemoglobin protoplasm. Compén. oc., No. 4. Apo. oil imm., 2 mm.

FIG. 2.



Bone-marrow of leukaemia. *a*, large polymorphous nucleus with haemoglobin protoplasm; *b*, large erythroblasts with imperfect mitotic division of the nucleus; *c*, fat-cell. Compén. oc., No. 4. Apo. oil imm., 2 mm.

FIG. 3.



Bone-marrow of leukaemia; *a*, true erythroblasts surrounded by a mass of protoplasm containing haemoglobin. Compén. oc., No. 4. Apo. oil imm., 2 mm.

and therefore fail to contribute to the formation of red blood-cells. This is true at least of the present case of leukæmia.

I wish to call especial attention to the cell marked with the letter *a* in Fig. 3. The two nuclei represented in this cell are surrounded by a transparent zone. The nuclei are homogeneous and stain intensely red with safranin. It will be seen later on that bodies similar to these nuclei are especially concerned in the formation of red blood-cells. Cells similar to the one marked with the letter *a* are found containing even a larger number of nuclei. These may be separated as in the present instance, or they may be joined together by filamentary prolongations. The protoplasm around them contains hæmoglobin. These cells undoubtedly represent ineffectual attempts at the formation of red blood-cells. As will be seen when we come to study the spleen, the successful formation of erythrocytes seems to take place only from free nuclei similar to those found within this mass of protoplasm. It will be seen, furthermore, that the successful formation of red blood-cells takes place only in contact with endothelial cells, and, in the present case, only in the spleen. We should not fail to notice the marked difference that there is between the cell at present described and the one containing pale nuclei. The nuclear filaments that may be found joining the fragments of the nucleus in the latter cells are pale and usually thick, whilst the filaments of the multinuclear erythroblasts are stained intensely red and are very fine. I should mention here that when the triple stain of safranin, orange G, and methyl-blue is used, the pale nucleus of the so-called leucoblasts takes a greenish color, whereas the homogeneous nucleus of the erythroblasts, whether found free or within the protoplasm of large cells, takes the red stain of the safranin. In fact, the orange G acts as a decolorizing agent, removing the safranin stain from all the structures except the erythroblastic nuclei. In the upper part of Fig. 3 a few cells are shown presenting the greenish stain in contrast with a few homogeneous small nuclei stained red. The appearance of structure in some of these red nuclei will be noted later on.

We find also in the bone-marrow a large number of cells, each of which contains a large vacuole and presents a few granules of fat in the protoplasm around the vacuole. These are evidently fat-cells from which the infiltrated fat has been removed.

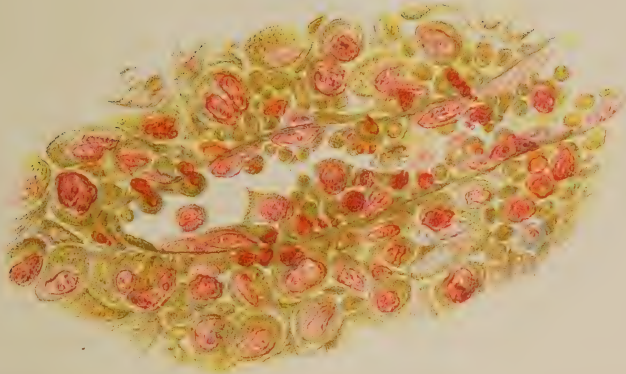
Red blood-cells of various shapes are found in the channels of the marrow together with the cells above described. Many of them are very pale, and some of them are nucleated red blood-cells. We find nowhere any clear evidence of pigmentary degeneration of these cells.

In the spleen we find a general increase of the connective-tissue reticulum. We find here, as in the marrow, a number of parallel channels, some of them lined with endothelium and others not. The latter are frequently crossed by fibrillar prolongations of the reticulum. The nodes of the latter present here and there stellate connective-tissue cells and occasionally a flat endothelial cell with a slightly projecting pale oval nucleus.

These spaces contain cells similar to those that have been described in the bone-marrow. The number of red blood-cells, however, is greater, as is also that of the free nuclei that we shall describe here as true erythroblasts. These are most numerous in the immediate vicinity of the channels that possess a distinct endothelial wall. These will be considered as capillaries. The point that I wish particularly to call attention to is the behavior of the erythroblasts in the immediate neighborhood of the endothelial channels. It is here that we see for the first time anything like the formation of red blood-globules. The process is something as follows :

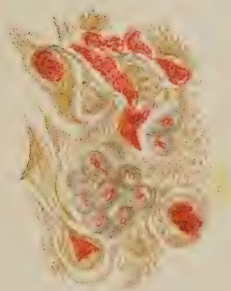
The small free erythroblast sends a prolongation of varying length through the endothelial wall, from without towards the interior of the vessel. This prolongation just within the endothelial lining swells into a bud which may be smaller or larger than the erythroblast from which it springs. This small bud presents the same peculiarities as the erythroblast outside. It is around this bud that we see the formation of the red blood-cells. These seem to grow around the bud as a protoplasmic formation around the nucleus, except at the point of contact with the filament. If the bud presents a round shape, the hæmoglobin-holding protoplasm is also globular. If the bud is pear-shaped, the protoplasm generally presents the same outline. Occasionally the protoplasm grows more from one side of the nucleus. The union between the erythroblast and the bud may be very close, presenting the appearance of a large diplococcus divided by a line of endothelial membrane. In other cases the filamentary union may be as long as nine μ . In some cases the bud has been evidently broken off, or has not formed, and the end of the filament can be seen pointing in the endothelial wall. When the bud-cells, with their hæmoglobin envelope, are disengaged from the endothelial wall they constitute a nucleated red blood-cell. As some of these nuclear buds are found of very small size, with a large blood-cell around them, it is very probable that the latter may be loosened from its anchorage without any nuclear contents, thus constituting a fully-developed red blood-cell. There is also evidence that the bud may be loosened from its moorings without any hæmoglobin formation about it. In this case it constitutes, it appears to me, a true blood-plaque. The measurements of one of these buds give for the red homogeneous nucleus within the endothelial channel three μ in diameter, the red body outside of the endothelial channel measures two μ in diameter, the filament between them one μ , and the hæmoglobin capsule five and a half μ . Another one in the same capillary presents a bud of one and a half μ in diameter and a hæmoglobin capsule of six μ . The filament penetrates the endothelial wall for a distance of two μ . Here it has evidently broken off in the preparation. The outline of the hæmoglobin envelope is generally globular, and the protoplasm is slightly granular and yellow. In another capillary we find the following evidences of budding. First, a homogeneous red body three and a half μ in diameter in close contact with the external surface of the endo-

FIG. 4.



Capillary of leukæmic spleen, showing budding of erythroblasts through the endothelial wall. Three specimens are shown in the upper wall. Compen. oc., No. 4. Apo. oil imm., 2 mm.

FIG. 9.



Sporoblast-like body. Compen. oc., No. 4. Apo. oil imm., 2 mm.

thelial wall, through which it sends a tip-like projection one and a half μ long by one μ wide. This is capped within the blood-vessel by a pear-shaped red blood-cell very slightly larger than the erythroblast without. Next to this there is an endothelial nucleus, and just beyond it another filamentary figure (Fig. 5, *a*) with the following dimensions: Outside of the endothelial channel there is a round, intensely red, homogeneous body. This body measures nearly three μ in diameter. There is no protoplasm about it. From this body a fine filament, slightly bent upon itself, extends a distance of six μ to a similar red body just within the endothelial line. The fine filament expands slightly as it goes through the endothelial wall, thus giving something of a pear-shape to the body within the endothelial channel. The latter body is equal in diameter to the one outside. The hæmoglobin capsule springs from one side of this body and is somewhat oval in shape, measuring three by three and a half μ . A small portion of hæmoglobin protoplasm is also seen projecting from the opposite side of the endothelial bud. Further on we find (Fig. 5, *b*) a pear-shaped red body close to the endothelial lining, with a point embedded in it. This is continued into a short filament somewhat bent upon itself, and terminates in a similar pear-shaped body within the endothelial channel. Springing from this we have a pear-shaped red blood-cell measuring about six μ in diameter; next to this there is a closely-joined couple of pear-shaped bodies. All these are found upon the same side of the capillary within a distance of fifty μ . This process of filamentary budding never takes place through the endothelial nucleus, but through the cement or the protoplasm of the flat endothelial plate.

There are several reasons to support the view that these filamentary buds project from without to the interior of the capillary. They are as follows:

1. We always find an absence of hæmoglobin around the erythroblast outside of the endothelial channel. It is reasonable, then, to suppose that the globule acquires its hæmoglobin envelope after it penetrates the endothelium and comes in contact with the circulating plasma.

2. We find in the majority of instances that the body outside of the endothelial channel is larger than the one within.

3. We find also evidences of progressive chromatolysis in the bud, usually in proportion with the growth of the hæmoglobin capsule. Sometimes there is nothing left but the point of the chromatin filament to which the red blood-cell is attached. The bud further shows evidences of dissolution by breaking up into minute filaments radiating for a short distance from the point of attachment. The latter change gives these corpuscles, with their filamentary tail, the appearance at times of spermatozoa.

The small, round erythroblasts are not always homogeneous. Some of them present, within the well-stained nuclear matrix, minute granules of a darker color. These are so arranged sometimes as to give the impression of mitotic figures. It is probable that they are such, but it is difficult to analyze them on account of the intense coloration of the matrix and the

close packing of the supposed mitons. In other cases we find within the erythroblast fine lines of a lighter color than the surrounding substance. In such cases the chromatic substance appears broken up into four fragments by a pale crucial figure. The erythroblasts engaged in the process of filamentary budding are homogeneous, except that occasionally, as previously mentioned, the bud breaks up into small rays extending a short distance into the red blood-cell. Erythroblasts that are not engaged in the process of filamentary budding are frequently of a larger size. In these a densely packed coil of chromatin may be seen, and sometimes a rearrangement of the miton in obscure karyokinetic figures. I am of opinion that in such cells the nuclear matrix may swell before the nucleus divides, and the cell is thus converted into the so-called leucoblast.

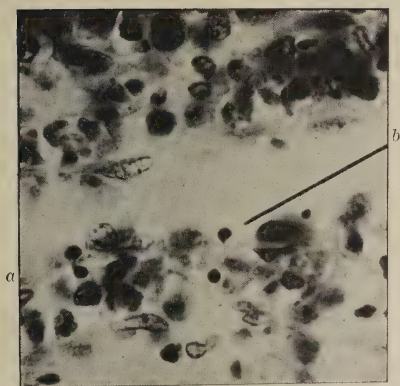
Though the splenic channels, endothelial or non-endothelial, are frequently crowded with red blood-cells of varying shape, we find very little evidence of pigmentary degeneration. The irregular distribution of these red blood-cells makes it difficult to decide upon the nature of the endothelial channels,—that is, as to whether they are or are not true capillary continuations of the blood-vessels of the spleen. In my opinion they are; but this question belongs to one of the many difficult problems in the histology of the spleen.

For purposes of comparison, the spleens of a case of cardiac anæmia and of progressive pernicious anæmia have been examined. In neither of these have the filamentary figures been found. It must be stated, however, that in the case of pernicious anæmia the tissues were not fixed in osmic acid, and that in the case of cardiac anæmia, though the attempt was made to fix the tissues by means of osmic acid, the result was not quite successful, evidently on account of post-mortem changes.

In the spleen of cardiac anæmia the number of red blood-cells in the spleen channels is very great. The endothelial cells show no evidences of division. They are, however, more numerous and more globular than in the cases of leukæmia. They project further into the endothelial channel. Sometimes they are very close together, leaving scarcely any space between them. The closer together they lie the more prominent and globular they appear. These endothelial nuclei measure between nine μ and twelve μ in length and five μ in width. The endothelial channels, besides containing frequently a large amount of hæmoglobin-cells, contain also a few leucocytes. The majority of them are multinuclear, and many of them contain fat-granules in their protoplasm. Occasionally we find an erythroblast nucleus in the interior of a protoplasmic body containing hæmoglobin. These are not found in endothelial channels. Free erythroblasts are also numerous.

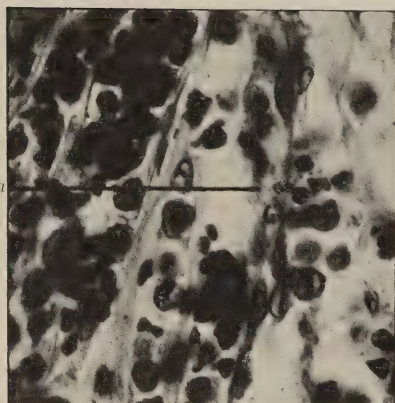
In the case of pernicious anæmia the endothelial nuclei are still more swollen and numerous than in the case of cardiac anæmia. The capillary spaces are evidently dilated. In both the spleen and marrow we find distinct evidences of pigmentary degeneration of the red blood-cells. We

FIG. 5.



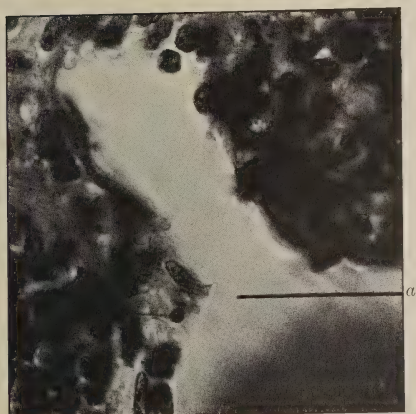
Capillary of spleen, described in detail in the paper. *a* and *b* indicate erythroblasts in process of filamentary budding. Case of leukaemia. Project oc., No. 2. Apo. oil imm., 2 mm.; camera length, 85 cm.

FIG. 6.



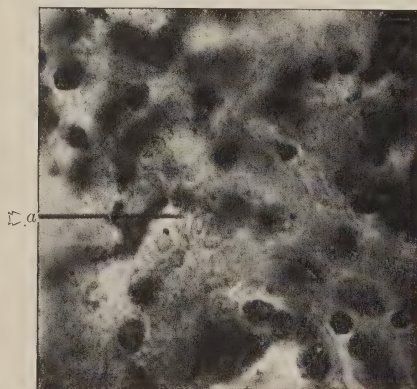
Section of leukaemic spleen, showing erythroblasts in process of budding. Minute bud within the endothelial channel surrounded by a haemoglobin envelope. Project oc., No. 2. Apo. oil imm., 2 mm.; camera length, 85 cm.

FIG. 7.



Long filamentary budding in endothelial channel. Project oc., No. 2. Apo. oil imm., 2 mm.; camera length, 85 cm.

FIG. 8.



a, sporoblast-like body, bone-marrow of leukaemia. Project oc., No. 2. Apo. imm., 2 mm.; camera length, 85 cm.

also find, especially in the marrow, rows of fat granules in the endothelial lining of the vessels. These rows are generally discrete, and sometimes they bifurcate, leaving the nucleus in the middle. The number of erythroblasts is smaller in these organs than in those of leukæmia. The same may be said of the number of eosinophile cells.

As to the origin of the erythroblasts, the opinion is maintained in the course of the paper that all the cells described may develop one from the other through a species of metaplasia, the starting-point of which is probably the lymphocyte. The erythroblast appears to originate in the shape of spherical fragments of chromatin that are thrown off from the nuclei of other cells; and the latter may again develop from the erythroblasts by a process of chromatolysis and swelling of the nuclear matrix. I do not pretend, however, to insist upon this point. The opposite view, that gives the erythroblasts a specific character and traces their origin to embryonal red blood-cells, is also well supported.

My object in this paper has been to call attention to the process of filamentary budding of erythroblasts through the endothelial wall as a factor in the formation of red blood-cells. It is very improbable that this process should occur in the leukæmic spleen and not under normal circumstances.¹

Figs. 4, 5, 6, 7 show capillaries of the spleen in which the process of filamentary budding manifests itself. Fig. 5 has been described in the text. In Fig. 6 a couple are shown in which the endothelial bud is of very small size and shows evidences of breaking up into indistinct filaments within the red blood-cell. This figure shows an arrangement of the parts that is frequently met with,—namely, that the endothelial channels are much narrower than the non-endothelial channels around them. Fig. 7 shows a very long filamentary bud. In Fig. 4 a capillary is shown, in the upper border of which three filamentary buds are forming.

Figs. 8 and 9 represent peculiar bodies found in the marrow of the case of leukæmia. It is impossible to account for these either by supposing them to be forms of degeneration of the nucleus or groups of red blood-cells. They resemble somewhat a sporoblast formation. By careful focussing the group is found to consist of nine cyst-like bodies, each one of which measures three or four μ . They are vesicular in structure and present a rod-shaped body lying near the periphery of the vesicle. The vesicles take a pale reddish-gray color with safranin, and the rod-shaped body stains intensely red. A considerable number of these are found in the marrow of the case of leukæmia. They may be found in groups of twos and threes; the one represented in Fig. 9 and reproduced from a photograph in Fig. 8 is the largest and most distinct of these groups that I have found. It is possible that these may be indications of the so-called "vesicular degenerations" of the nucleus, or that they

¹ Since the reading of this paper I have found the same process in the spleen of the rat, and of the rabbit, after hemorrhage.

might be red blood-cells of small size presenting some change in their wall which leads to the appearance of the rod-shaped nucleus. It must be admitted, however, that these explanations are not satisfactory, and that the nature of these bodies must be left in doubt until opportunity is given for a more complete investigation.

OBSERVATIONS OF ANTITOXIN IN DIPHTHERIA.¹

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DURING the past nine months I have had the opportunity of observing an extensive and thorough trial of antitoxic serum in the treatment of diphtheria, and I have thought that a brief account of my observations might be of interest to the members of this society. All of the cases were seen in the service of one institution, the Willard Parker Hospital of New York; the conditions, therefore, were the same in all. The series of cases is so large that it should aid us in arriving at a fair estimate of the value of diphtheria antitoxin, as well as of its limitations, when used in hospital practice.

The systematic use of antitoxin was begun in the Willard Parker Hospital at the commencement of the present year, though the serum employed during the month of January was, unfortunately, not strong enough to give the best results. Previous to this year dependence was placed upon the local and constitutional treatment which was in general use elsewhere before the introduction of antitoxin, and the results obtained compared very favorably with those in hospital practice in other cities of this country and Europe. All cases on entrance were irrigated with normal salt solution, and this irrigation was repeated every two hours or even every hour, until the nares were free from discharge or obstruction and the pharynx clear of membrane. Poultices were employed for the relief of glandular enlargement, and steam inhalations and calomel fumigations were in constant requisition to combat the onset of stenosis of the larynx. When these latter measures proved unavailing, intubation was resorted to, and, in a few instances, tracheotomy.

The general treatment consisted mainly of the administration of the tincture of the chloride of iron in large and frequent doses. Other tonics were used to meet special indications. Stimulants were not employed as a

¹ Read by title at the meeting of the American Climatological Association at its meeting at Hot Springs, Virginia, 1895, and furnished for publication November 5, 1895.

matter of routine, but, when needed, were given freely, particularly in septic cases.

Under the treatment thus briefly outlined the mortality ranged from thirty to thirty-eight per cent., varying somewhat with the season of the year and the character of different epidemics.

The antitoxin treatment, as I have said, dates from the beginning of the present year. From the 1st of January, 1895, to the 1st of October, 1895, there were admitted to the hospital five hundred and ninety-three cases of diphtheria. All of these cases, with the exception of some ten or twelve, were given antitoxin on the day of entrance into the hospital. The local and general treatment of former years was not entirely abandoned, but it has become of secondary consequence. Cases are irrigated on entrance, and the irrigation is repeated from time to time until all membrane has disappeared. Calomel sublimation is still employed, but with much less frequency. The tincture of the chloride of iron is no longer given at all. Patients receive iron, but in smaller doses, and only when it is especially indicated. Intubation and tracheotomy are still required to relieve stenosis of the larynx, but a larger proportion of laryngeal cases recover without operative interference than under former methods of treatment.

Of the five hundred and ninety-three cases under consideration, four hundred and thirty-eight recovered and one hundred and fifty-five died, a mortality of 26.14 per cent.

During the same period of nine months in 1894, four hundred and sixty-nine cases were treated in the hospital, of which three hundred and four recovered and one hundred and sixty-five died, a mortality of 35.18 per cent., nine per cent. greater than that for the present year.

TABLE I.

MORTALITY IN WILLARD PARKER HOSPITAL DURING THE FIRST NINE MONTHS OF 1895 AND IN THE CORRESPONDING PERIOD OF 1894.

1895.			
	Cases.	Deaths.	Percentage.
First quarter	156	52	33.33
Second quarter	256	75	29.29
Third quarter	181	28	15.47
Totals	593	155	26.14
1894.			
	Cases.	Deaths.	Percentage.
First quarter	147	53	36.05
Second quarter	214	83	38.78
Third quarter	108	29	26.85
Totals	469	165	35.18

By referring to Table I. it will be seen that the reduction in mortality under the serum treatment began in the first quarter of the year, and became more and more marked as the year progressed. These improved results are probably due to the greater strength of the serum employed, as well as

to the more efficient dosage during the later months, the natural consequence of longer experience in its administration.

The simple statement that antitoxin lowers the death-rate in diphtheria does not enlighten us very much as to its exact value in different forms and stages of the disease. I have, therefore, analyzed our cases so that we can study them from the various stand-points. It is claimed that antitoxin acts as a specific in diphtheria when given on the first or second day of the disease, its value diminishing rapidly after the third day. The critics of the new treatment, on the other hand, assert that the older methods were also capable of controlling the disease if applied at its very beginning.

Table II. will show how far these respective claims hold good in the experience of the Willard Parker Hospital:

TABLE II.

DEATHS ACCORDING TO DAY OF DISEASE UPON WHICH TREATMENT WAS BEGUN.

1895.		
Day upon which treatment was begun.	Cases.	Mortality percentage.
First day	108	10.09
Second day	130	25.19
Third day	116	34.19
Fourth day	87	31.82
Over four days	152	36.64
Totals.....	593	26.14
1894.		
Day upon which treatment was begun.	Cases.	Mortality percentage.
First day.....	43	26.67
Second day	120	33.61
Third day.....	111	35.40
Fourth day.....	74	35.53
Over four days.....	121	36.29
Totals.....	469	35.18

According to this table, one hundred and eight cases were given antitoxin on the first day of the disease, and 10.09 per cent. died. In 1894, in the preantitoxin period, there were forty-three cases which came under treatment on the first day, and the mortality was 26.67 per cent., two and one-half times as great as in the cases treated with antitoxin. On comparing the two groups of cases which did not receive treatment until the second day of the disease, we again note a difference in favor of antitoxin. Here, however, the difference ends abruptly, the average death-rate in all cases treated after the second day being only two per cent. less in 1895 than in 1894. This table, then, though far from supporting the claim that antitoxin is a specific in diphtheria, apparently proves conclusively that the new treatment, when applied early in the disease, gives much better results than the older methods.

It has been apparent to all those in attendance at the hospital during the present year that fewer patients have presented the symptoms of sepsis than

in former years, and that, on the other hand, a much larger proportion have developed broncho-pneumonia at some period during their stay in the wards. With a view to elucidating these points I have prepared Table III., which gives the causes of death in 1894 and 1895, with the numbers dying of each cause, and the percentage of mortality from such cause in each year :

TABLE III.
CAUSES OF DEATH.

1895.		
	Totals.	Percentage.
Broncho-pneumonia.....	66	53.22
Laryngeal stenosis	17	13.71
Sepsis.....	13	10.48
Heart failure	11	8.87
Pulmonary œdema	6	4.84
Paralysis	4	3.23
Nephritis	3	2.42
Bronchitis.....	2	1.61
Pulmonary gangrene	1	0.81
Meningitis	1	0.81
Totals.....	124	100.00
1894.		
	Totals.	Percentage.
Broncho-pneumonia	24	16.90
Laryngeal stenosis	44	30.99
Sepsis.....	46	32.39
Heart failure	12	8.45
Pulmonary œdema	4	2.82
Paralysis.....	6	4.23
Nephritis.....	1	0.70
Bronchitis.....	2	1.41
Pulmonary gangrene	2	1.41
Meningitis.....	1	0.70
Totals.....	142	100.00

A case of diphtheria progressing to a fatal termination presents so many symptoms and complications that it may be very difficult to decide as to the determining cause of death. The above table, however, is compiled from the records of the hospital, which are based upon careful clinical study of each individual case, often supplemented by *post-mortem* examination.

NOTE.—This table only includes cases which died in the Willard Parker Hospital. A number of cases in each year developed symptoms of other infectious diseases, such as scarlet fever, measles, or varicella, and were transferred to the Riverside Hospital on North Brothers Island.

The great mortality from broncho-pneumonia during the present year is the most striking feature of the table, over one-half the deaths being attributed to this complication of diphtheria, whereas only one case in six died of this cause in 1894.

On the other hand, laryngeal stenosis and sepsis, which together caused sixty-three per cent. of the mortality last year, have proved fatal in less than twenty-five per cent. of the cases since the introduction of antitoxin. As I have already said, it had been noticed how few of the patients this year developed sepsis, while cases after cases showed the signs of broncho-pneumonia, particularly when apparently convalescent from the diphtheritic process. This late development of broncho-pneumonia has been one of the most disappointing features of our experience with antitoxin. Patients would be relieved of stenotic symptoms, either with or without intubation, only to die two, three, or even four weeks later of pulmonary complications. It should be said, however, that most of the deaths from broncho-pneumonia occurred in operative cases, and that there have been many more such cases this year than in 1894. An unusually large proportion of the patients entering the hospital had laryngeal symptoms on entrance. Many of these were apparently relieved by antitoxin, and of those who still required operative interference, a larger proportion recovered from the immediate effects of the operation than in former years. Could these patients have been protected from the later invasion of the streptococcus, the number of recoveries after intubation would have been very large.

The following table will show what difference, if any, there was in the duration of stay in the hospital of fatal cases of broncho-pneumonia, laryngeal stenosis, and sepsis in 1895 and 1894:

TABLE IV.

DURATION OF STAY IN HOSPITAL OF FATAL CASES OF BRONCHO-PNEUMONIA,
LARYNGEAL STENOSIS, AND SEPSIS.

	1895.	1894.
Broncho-pneumonia.....	13.7 days.	2 days.
Laryngeal stenosis	3 "	2 "
Sepsis.....	3 "	2 "

According to the table, sepsis and laryngeal stenosis, when unrelieved, proved rapidly fatal in both years. The figures for broncho-pneumonia, however, are widely different in the two years. The two weeks' length of stay in the hospital of fatal cases in 1895 illustrates the late development of the disease to which I have referred above.

I have already intimated that, in my opinion, the great reduction in the mortality from laryngeal stenosis was, in large part, due to the administration of antitoxin, but I am in doubt as to whether or not the even greater falling off in the deaths from sepsis is to be credited to the same cause. It is the impression of Dr. Somerset, the resident physician, that very few cases of septic diphtheria entered the hospital during the present year. I have myself noticed, in my visits to the wards, the rarity of the hopeless hemorrhagic cases which were seen so frequently in preceding years. It will require a careful study of the records to determine whether the lessened

mortality from sepsis since the introduction of antitoxin is of any therapeutic significance.

The remaining causes of death in Table III. show a close correspondence in the two years, and call for no remark.

I had hoped to be able to present the exact comparative death-rate for 1894 and 1895 of laryngeal cases, both operated and non-operated, but I shall have to be satisfied for the present with the statement that the total mortality for intubation and tracheotomized cases in the present year is sixty-eight per cent., as compared with eighty-five per cent. in 1894.

It is my impression that the laryngeal cases which escaped operation show an even greater reduction in the death-rate from that for the previous year.

No study of the value of antitoxin in diphtheria would be complete without careful consideration of the age of the patients under treatment. Children under two years of age usually die in spite of all our efforts, whereas older children and adults will often get well without any treatment whatever. I have, therefore, classified our cases according to age, with the percentage mortality for 1895 and 1894:

TABLE V.

MORTALITY ACCORDING TO AGES OF PATIENTS.

1895.		
	Cases.	Mortality.
Under 2 years	101	70.59 per cent.
2 to 4 "	129	41.54 "
4 to 6 "	101	19.61 "
6 to 8 "	66	14.93 "
8 to 10 "	30	3.23 "
10 to 12 "	24	4.00 "
12 to 14 "	28	0.00 "
14 to 16 "	19	0.00 "
Above 16 "	95	6.00 "
Totals	593	26.14 "

1894.		
	Cases.	Mortality.
Under 2 years	89	67.02 per cent.
2 to 4 "	116	46.28 "
4 to 6 "	87	36.96 "
6 to 8 "	54	23.73 "
8 to 10 "	31	11.11 "
10 to 12 "	12	7.14 "
12 to 14 "	6	0.00 "
14 to 16 "	4	0.00 "
Above 16 "	70	4.00 "
Totals	469	35.18 "

Table V. indicates a lowering of the death-rate by the serum treatment in cases between two and twelve years of age. This accords with the

published experience of other hospitals. The unfavorable showing for antitoxin in cases over sixteen years of age is also in agreement with the observations abroad.

The increased percentage of deaths this year among cases under two years of age is, however, surprising and contrary to experience elsewhere. It is true that a large proportion of these cases came to the hospital in an advanced stage of the disease. Many also were laryngeal cases which required intubation or tracheotomy, and further analysis will probably show that broncho-pneumonia played a large part in determining the fatal issue.

The above statistical tables demonstrate fairly, I think, that diphtheria antitoxin has considerable therapeutic value, even in hospital practice, an admittedly poor field for a demonstration of its curative action. The same tables also point out the limitations of the new remedy to which I referred in the beginning of this paper. A reduction of nine per cent. in the mortality of diphtheria, or a saving of nine more lives in every hundred patients, is indeed a great gain, but a death-rate of twenty-six per cent. still remains to combat the claims of antitoxin as a specific in the disease. The chief reason, to my mind, why the experience of the Willard Parker Hospital is not more favorable is that the patients enter the hospital at such an advanced stage of the disease. We have seen in Table II. that only one hundred and eight cases of the total number of five hundred and ninety-three came under treatment on the first day of the disease. It is my own belief that the great majority of these one hundred and eight cases had been ill for two, three, or even more days when they were brought to the hospital. The clinical signs in the throat and the general condition were sufficient evidence of this in many cases. The testimony of parents of the class from which these patients came is but little to be depended upon. Whatever good results we have seen from the serum treatment are accomplished in the face of very great difficulties, and I am confident that in private practice among intelligent people the specific character of diphtheria antitoxin will be demonstrated. Welch, in his recent paper, has collected the reports of six hundred and sixty-three cases in private practice, with forty-six deaths, a percentage of only 6.9, almost exactly twenty per cent. less than the mortality of our five hundred and ninety-three hospital cases.

Before closing I wish to say a few words on the secondary streptococcus infection in diphtheria, with especial reference to the probability that we shall, in the near future, be in possession of a streptococcus antitoxin. We have seen how large a proportion of our cases died of broncho-pneumonia, a complication not due to the Klebs-Löffler bacillus, but to a distinct micro-organism, the streptococcus. Could we have successfully antagonized this secondary infection, half of our deaths could have been avoided. This possibility appealed to me this last year with especial force whenever I saw the pulmonary complication develop in convalescents who perhaps were on the point of being sent home as well. I often longed for a recovery hospital,

so to speak, to which they might be sent to convalesce, free from the infection which must be present in the neighborhood of active cases of diphtheria, especially operated cases. But even this transfer might not save them, for Welch believes that the streptococci which are present in the normal throat are capable of setting up the pulmonary process in an individual already weakened by the effects of the Klebs-Löffler bacillus.

It is, therefore, most satisfactory to note the progress that has been made in the production of a streptococcus antitoxin.

It has long been believed that there are several varieties of streptococci, each of which is capable of producing distinct pathological effects. It is now claimed, however, by T. J. Bokenham, the late Research Scholar to the British Medical Association, that streptococci observed in connection with different pathological conditions are not distinct, botanically, from each other. If the culture conditions are changed the characters of the microbes become altered in many cases. By using for several successive generations the living tissues of rabbits, Bokenham has first obtained erysipelas, then later a pus production, and still later a general infection, very virulent in character, but with no evidence of either erysipelas or pus production. If the series be sufficiently prolonged, the streptococci become of such virulence that a fraction of a drop of the blood of an animal killed by them will set up an infection running a fatal course in a few hours. At the same time the cultural characteristics have become so changed that a bouillon culture of the microbe no longer resembles one of the original culture. The differences observed between streptococci obtained from different sources are not specific in character, according to Bokenham; they are accidental rather than inherent in the micro-organisms themselves. Therefore, Bokenham is convinced that for the preparation of a streptococcus antitoxin on the same lines as that of diphtheria, the source of the microbe is immaterial; the only necessity is that its virulence should be as great as possible. Unfortunately the streptococcus rapidly loses its virulence in the ordinary culture media. After long experimentation, Bokenham has finally found a satisfactory medium in a mixture of bouillon and asses' serum. He states that he has already succeeded in partially immunizing an ass so that its serum has some protective power. Similar experiments are being carried on in France and in Germany, and there is good ground for hope that we shall soon have an anti-streptococcic serum to supplement the anti-diphtheritic serum in the treatment of diphtheria and its complications.

THE GERM OF CHANCROID.

BY G. FRANK LYDSTON, M.D.,

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THE question of the specificity of chancroid has disturbed the professional mind ever since Bassereau, in 1832, demonstrated the duality of chancre and chancroid. As is well known, even the observations of Bassereau were not universally accepted. Indeed, it is worthy of remark that such eminent men as Jonathan Hutchinson and Moritz Kaposi still pose as "unicists" in syphilography. Although many attempts have been made to demonstrate a specific germ in chancroid, and many germs have been discovered, it is nevertheless true that the most practical of our clinicians have held, with Bumstead, that chancroid is the product of some form of septic infection, developed under the favoring environment afforded by filth, local irritation, pathological and physiological discharges in a state of decomposition, moisture, and protection from air and light. Bumstead, to be sure, was unfamiliar with the germ feature of the condition which he described, yet his conclusions are made sounder by our more recent knowledge of germ-infection. The hypothetical virus taught by Bumstead is rendered intelligible by our modern views of bacterial evolution. Such men as Finger and Campana had not, up to the time of the Congress at Rome (1894), renounced views which were essentially those of Bumstead.

Among the early alleged discoveries of a specific germ in chancroid were those of Wood and Hallier in 1868, and Salisbury in 1873. These workers, following the lines laid down by Hausmann, Adam, and Deidier, in the latter part of the eighteenth century, professed to have settled the question by the discovery of a special form of germ which was undoubtedly the specific cause of soft chancre. Like their predecessors, these men failed to obtain recognition or, at least, acceptance of their views. Many researches have since shown that the poisonous properties of chancroidal secretion are quite similar to those of other septic fluids. Pasteur, Koch, Lestikow, Morrison, and Mannio have all made this observation, and have confirmed a view which is supported by clinical experience.

Many of the alleged discoveries of a specific chancroidal germ have been of organisms which are quite familiar to us in other rôles than that of a specific venereal germ. Thus, in 1885, Ferrari discovered a "specific" germ which was an ordinary saprophyte. As this germ was found in a chancroidal ulcer, the inference seems to have been that it was the *fons et*

origo of the disease. Later on, Lucca captured a microbe which the iconoclastic Gibert afterwards showed to be a pus-generating staphylococcus.

Straus, in 1884, experimented upon the pus of virulent bubo, and claimed it to be sterile; this result is hardly consistent with the specific germ theory of chancroid. The first work of any accuracy and importance was done by Ducrey, of Naples, in 1889. At that time he presented a paper to the International Congress of Dermatology, entitled "*Recherches expérimentales sur la Nature intime du Principe contagieux du Chancere mou.*" In this essay Ducrey described what he claimed to be the pathogenic bacillus of chancroid, with his methods of coloration and collection in pure, or almost pure, culture by inoculations in series. He showed that the bacillus for which he claimed specificity was always associated with divers other microbes, and finally presented evidence which tended to show the specificity of the germ which he had discovered.

Following Ducrey, the subject has been carefully investigated by numerous observers with varying results. Welander and Krefling, three years after Ducrey's contribution, confirmed his observations, while at the same time Jullien asserted that he had obtained only negative results in the same line of experimentation. In 1892, Unna claimed to have discovered in sections of the tissues, in the neighborhood of a chancroid, a bacillus which he believed to be different from that described by Ducrey, but Nicolle, Columbini, and others afterwards showed the identity of the two. Columbini, Nicolle, and Audry subsequently showed the same bacillus to be present in chancroidal bubo. Numerous other observers have confirmed the latter observation. Columbini's researches, in particular, have been exhaustive and careful, and tend to show that a special form of bacillus is to be found in chancroid and its attendant bubo, and that it is neither susceptible of cultivation nor of inoculation upon the lower animals. It will be observed that the latter point militates somewhat against the specificity of the germ. It is evident, upon surveying the work that has been presented, that the credit of the discovery of a special form of microbe in soft chancre belongs, not to Unna, to whom it has been accredited in some quarters, but to Ducrey.

Accepting the presence of a specific type of germ in chancroid,—irrespective of the question of its etiological specificity,—it may be profitable to consider in a general way the methods of study of the germ which may be employed. It would seem that the germ is quite easily colored, the most varying methods being used for this purpose. Ducrey used gentian violet, methyl blue, or an aqueous solution of fuchsin indifferently, these stains being equally satisfactory. Ducrey, recognizing the multiplicity of germs likely to be present in the chancroidal secretion, used the pus from pustules produced by auto-inoculation. Nicolle's method is perhaps the most simple and practicable. The ulcer is first cleaned with a pledget of absorbent cotton wet with sterilized water. The surface is then gently scraped with a fine blunt curette without producing hemorrhage, the ac-

accumulated secretion being then deposited upon a properly sterilized plate. A second plate is laid upon the first, and the drop of secretion carefully pressed out into a thin layer. The two plates are next separated by sliding them carefully apart, and the preparation fixed in the flame. As will be observed, the method is quite similar to that employed in searching for gonococci. The specimen, being ready for staining, may be prepared either by single or double coloration. In the simple method, the prepared cover-glass is immersed in a solution of gentian violet for about three-quarters of a minute. After washing in distilled water, the specimen is ready for examination. In the double coloration method, the cover-glass should be first immersed in the gentian violet for two or three minutes and then placed in Gram's solution for about one minute, after which it is to be decolorized by absolute alcohol. After decolorization, the specimen should be immersed in fuchsin solution for a few seconds. The special bacillus appears of a rose-red color. The other organisms which may be present in the specimen (notably pus cocci) retain a violet color.

The Ducrey bacillus does not appear to be susceptible to arbitrary arrangement, being found isolated, in masses, or in chain-like form. As seen in its isolated form it is short and rather thick, with rounded extremities. The dimensions of the microbe are quite variable. Ducrey has described the germ as having two lateral notches, which give it something of the appearance of a dumb-bell or of a figure eight. The germ, in a measure, resembles a diplococcus, on account of the peculiar conformation above described. As illustrative of the widely varying interpretation of microscopical forms by different observers of equal competence, it is interesting to know that Nicolle, Petersen, and others have failed to observe the peculiarity of form described by Ducrey.

Naturally enough, those who dispute the accuracy of Ducrey's description attribute the disparity of results to crudity of manipulation or even optical illusions on the part of the opposing faction. The most striking peculiarity of the bacillus is that its affinity for coloring matter appears to be limited to its extremities, the central portion resisting coloration, the resulting appearance having been described as similar to a weaver's shuttle. It would seem, from the most recent observations, that the Ducrey bacillus is most often found isolated, its aggregation in masses being asserted by Nicolle to be due to the disturbance of the pus incidental to rubbing the slides upon each other in the process of preparation for coloration. The chain formation, which is occasionally seen, is short, and rarely comprises more than from two to five bacilli.

In a comprehensive article, Le Damany (*Gaz. hebdom. de Médecine*, January, 1895) sums up the characters of the Ducrey bacillus as found in the pus of simple chancres as follows: "The bacillus, when viewed singly, is short, ordinarily thick, with rounded extremities, and in the centre is a clear space. The germ is frequently grouped in masses or short chains, the latter being sometimes fasciculated, and is decolorized by Gram's method."

The Ducrey bacillus is not uniformly disseminated throughout chancroidal pus; according to Le Damany some preparations contain a very large number of the germs, while in others very few can be detected and only with extreme care. The number varies greatly, not only with specimens taken from the same sore, but more widely still in specimens taken from different sources. The bacilli are found both within and without the pus corpuscles; in some instances the majority of them are found within the pus elements with comparatively few outside of them; in others, again, the reverse is the case. When found within the pus corpuscles the bacillus is generally single.

However strongly the claims of the Ducrey bacillus may be presented, a survey of the varied and manifold kinds of germs found in chancroidal pus in intimate association with the alleged specific bacillus, bears abundant testimony to the decidedly mixed character of the infection. Staphylococci of several varieties, gonococci and streptococci are found in abundance. The gonococci are, of course, most often associated with a complicating gonorrhœal urethritis, but are found in cases in which the latter condition does not exist. Nicolle has found a bacillus similar to the staphylococci ordinarily found in the skin in considerable numbers. This resembles the Ducrey bacillus very strongly, but is readily distinguished by its uniform coloration, and the fact that it is not decolorized by Gram's solution. Other germs have been described,—*e.g.*, septic vibrios, by Pasteur, the bacterium coli commune, and the co-called spirillum of balanitis. It is claimed that the Ducrey bacillus may be isolated by auto-inoculation upon an aseptized surface, but to the practical surgeon it would seem impracticable to obtain in this manner a culture disassociated from pyogenic cocci.

The most important evidence of the specificity of the Ducrey pathogenic organism is the fact that numerous and competent observers have failed, after many attempts, to find the germ in anything but chancroid. Unfortunately, the chain of evidence will be incomplete until pure cultures can be made outside of the tissues,—a condition difficult of accomplishment. As might be expected, the germ endures until cicatrization of the ulcer begins. The transformation of chancroid into simple ulcer, as a *sine qua non* in repair, is a clinical observation as old as chancroid itself.

The relation of the specific bacillus to neighboring pathological changes and to virulent bubo is quite important. To obtain a section, a small area of the ulcer and its sublying tissue is excised by mouse-toothed forceps and knife or scissors; this is fixed, stained, embedded in paraffin, and sections made in the usual manner. It would seem quite easy to select a coloring substance, as picrocarmin, thionin, toluidin, hematoxylin, and methylene blue are of almost equal value. Methyl blue is, of course, rather the simplest and most readily accessible. Under the microscope the Ducrey bacillus and cell nuclei will be found to be a deep blue, while the cell-substance is of a clear, light-blue color. As might be expected, the sections show a multiplicity of bacterial forms, but it is a noteworthy fact that the proportion of

ordinary germs is inversely to their distance from the periphery of the ulcer; thus pus cocci and saprophytes are found so abundantly near the surface of the section that it is often quite difficult to outline the Ducrey bacillus, while in the deeper layers the common bacteria and cocci disappear, leaving the specific micro-organism in undisputed possession of the field. The characteristic arrangement of the specific bacilli seems to be in chains of some length, which again are arranged in bundles. Upwards of a hundred bacilli may be found in a single chain. Phagocytosis is very much in evidence even at an early period, its prominence becoming more pronounced as repair advances.

The Ducrey bacillus, as found in tissue sections, is precisely the same as that found in pus, excepting that instead of a central clear space the coloration is uniform throughout. Examinations of chancroidal and bubonic pus show conclusively that the range of action of the chancroidal germ is practically limited to the point of inoculation. As far back as 1884, Straus claimed that the pus of bubo was absolutely sterile until it had been opened and infected from without. This opinion has since been shown to be only partially correct; but the assertion is still made that in by far the majority of cases the pus of bubo is, prior to communication with the external surface, either sterile or contains only common pus microbes, the Ducrey bacillus being rarely found. Secondary development of virulent properties is claimed to be due to infection from without. Granting that these assertions are correct, the primary bubonic suppuration (?) or tissue liquefaction must be due to the action of toxins upon the leucocytes.

A very obvious source of error is the existence of periaidenitic suppuration about infected glands; the discharge of true chancroidal virus from the latter at a variable period after incision explaining the secondary virulent infection. Here, the periaidenitic pus might be due to toxins or pus micro-organisms, while the glandular infection proper depended none the less upon Ducrey bacillus infection. Under such circumstances secondary infection of the abscess cavity and wound edges is inevitable sooner or later, and may be wrongly attributed to carelessness. In considering the bacteriology of chancroidal bubo, it is admitted that in many cases the ganglionic reaction is of a simple inflammatory character; this is a familiar clinical observation.

Recent inoculation experiments with chancroid upon animals appear to most emphatically contradict the views which have been held in certain quarters for many years, and to show that, like syphilis, chancroid is a disease which is peculiar to the human species. It may fairly be claimed that the successful inoculations practised by Auzias-Turenne, Diday, Basset, and others were really examples of pus-infection upon animals. Indeed, this is the principal argument of those who contradict the conclusions of these observers. Le Damany, in particular, calls attention to the fact that their experiments were not under bacteriological control. It is the belief of the writer, however, that this argument will not be a very effective one until

the germ of chancroid has been isolated by cultivation. Then, too, it will be necessary to explain why the results obtained by the early experimenters were, in some instances, apparently so typical. It is quite as safe to say that on the human subject the typical results of inoculation of chancroidal secretion are due to pus microbes or their products, as in the case of successful inoculations upon animals. It is true that Petersen has claimed to have made a pure culture of the germ, the inoculation of which produced chancroid, but this must be taken with due allowance, especially in view of the fact that Ducrey himself, Nicolle, and others of at least equal enthusiasm and greater experience, have absolutely failed to cultivate the germ in any of the media thus far known. The discovery of the bacillus of Ducrey has given additional impetus to animal experimentation, and the results seem to show that while inoculation upon man produces typical chancroid, those upon animals result only in the development of ordinary pustules. Such are the conclusions of Quinquaud and Nicolle.

It has long been known that the virus of chancroid retains its vital properties for a prolonged period. It will be remembered that Ricord enclosed chancroidal pus in hermetically-sealed tubes, and found that it was still virulent after a lapse of over two weeks. Desiccation does not seem to be very effectual in destroying the virulent properties of the virus. Over forty years ago Spirno claimed that he was able to produce chancroid by inoculation with a lancet upon which chancroidal secretion had been collected and dried seven months previously. It has been a matter of clinical observation for some years that heat, even of moderate intensity, is destructive of chancroidal poison. Aubert some years ago advocated the treatment of chancroid and its attendant bubo by prolonged hot sitz-baths, and the experience of the writer has shown that in certain malignant and destructive cases this method of treatment is well-nigh invaluable. That the germ is rapidly destroyed in complicating febrile conditions is also a matter of clinical observation.

Laboratory experiments justify the time-honored application of strong acids in the treatment of chancroid, by showing that the germ is non-resistant both to acids and powerful alkalis. The conclusion has been drawn, from the results of experiments in the action of heat upon chancroidal virus, that the relatively elevated temperature of the blood in the deeper regions of the body explains the non-constitutional character of chancroid.

Notwithstanding all that has been said regarding the Ducrey bacillus, it must be acknowledged that the case is by no means proven until successful cultures of the germ have been made. Inoculations with the pure culture, and these only, will conclusively demonstrate the specific character of the bacillus, and the writer believes that the virus which has thus far been used with the inoculation experiments nowhere nearly approximates the pure culture demanded in accurate inoculation experiments. It is to be hoped that the condition demanded will be fulfilled in the near future. No pos-

sible benefit will result in the therapeutics of the disease, but cases frequently arise in which a differential diagnosis is very important, and in which, for one reason or another, the test of auto-inoculation is not as satisfactory or as convenient as could be desired. It is not believed by the writer that bacteriology will ever disprove the *de novo* filth origin of chancre. Should, however, bacteriological research enable us to draw a sharp line of demarcation between simple and specific local ulcers, thus showing that they are *ab initio* in no wise related to each other, a great advance in our pathological knowledge will have been scored. The writer has great faith in the results thus far recorded, but while according due weight to the observations of Ducrey, Unna, and their followers, he is not yet prepared to accept the specificity of the Ducrey bacillus as absolutely proven. Special action is necessary in view of the fact that, as admitted by Ducrey himself, chancre, as it presents itself clinically, is a decidedly mixed infection with proportionately numerous sources of error and inaccuracy.

CARDIAC AND DIGESTIVE STRAIN FROM BICYCLE RIDING.

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THE writer does not wish to convey the impression that he thinks he has discovered a new clinical condition, but rather to describe briefly two illustrative cases, out of many that might be cited, and to call attention to some phases of bicycle riding, on which little emphasis has thus far been laid, and which might not be recognized by the most careful hygienist unless he had, at the same time, a practical acquaintance with cycling and was familiar not only with the modern, light-weight, safety bicycle but also with its predecessors.

Some weeks ago, H., aged nineteen, rode about a hundred and ten miles in less than a day and a half, including a delay of several hours' necessitated by a lacerated tire. Considering the youth of the patient, his slender build and comparative lack of training, and the roughness of a part of the journey, the feat was a remarkable one. The writer has driven over the same road, with a good horse, in two days and a half, and the horse did not recover his usual spirits for three or four days afterwards. H., on completing his journey, was considerably fatigued, but did not seek medical aid till several hours later, when he vomited almost immediately after a plain supper. At this time, without being feverish or in pain, he suffered from an intense general malaise, was nauseated, and at the same time felt the need of food and water. Bismuth and acetanilid were given to

relieve the nausea and nervous prostration, and the next morning strychnine was ordered in two milligramme doses before each meal on account of digestive failure. The patient was, of course, advised to rest, to take no more bicycle exercise for several days, to sleep as much as possible, and, without being placed on a special diet, to avoid all bulky and indigestible foods, and to subsist mainly on milk, eggs, broiled beef and lamb, and dry bread or toast.

A second case was seen in the person of a man of thirty, who was accustomed to riding but who had been out of practice for some months. After a ride of fifty-two miles, over bad roads for part of the way, and mainly against a head wind, he arrived home utterly exhausted, nauseated, and with a reflex headache. A tablespoonful of whiskey was immediately given, the first he had tasted for years, and therefore a relatively large dose. His temperature was 98° F., pulse weak, irregular, and occasionally intermittent, but not especially rapid, ranging about 85. After two hours' rest on a lounge he went to bed without much assistance but complained of feeling chilly, although the evening was warm. In about an hour more the chilliness had passed away and he took a luncheon of tea and toast. The next day he was able to attend to some business at home, but felt weak and sleepy, had little appetite, and staggered when he walked. During the following day or two he recovered his normal condition, except for a feeling that he must avoid any unusual exertion. Some years previously, the patient said, he had a similar attack, in which chilliness was the prominent symptom and from which without medical aid he recovered sufficiently to continue his journey on the next day. In this latter attack an opportunity was accidentally afforded to study the renal elimination under exertion. After arriving home, the patient voided three hundred cubic centimetres of urine, representing the accumulation of nearly the entire afternoon, after a luncheon of ice-cream, bananas, and chocolate. During two hours of this time the patient had been busy with numerous errands, occasioning about two miles of bicycle riding, in addition to his morning's ride of twenty-two miles, rather less walking, and much standing. Then followed a ride of about thirty miles against the wind, occupying, with halts, a little less than four hours. Contrary to expectations, an increase of elimination was not noted, save that the high specific gravity, dark reddish-brown color, and heavy, almost aromatic odor were taken to indicate an excess of salts, urobilin, and the volatile principle. There was neither albumin nor sugar. Urea was present in the proportion of nineteen parts in one thousand, representing 5.7 grammes, which is less than the average elimination for six hours in the normal adult under ordinary circumstances. Neither was there an excess of uric acid; no urates deposited on standing, and on adding strong hydrochloric acid to one hundred cubic centimetres of urine less than five centigrammes of uric acid were recovered. (The normal, daily elimination is about fifty centigrammes.) It is probable that there was a vicarious elimination through the perspiration and that the

low amount of nitrogenous waste may also be accounted for by the light luncheon.

It is a question whether the luncheon, unsuitable as it appears at first thought, was not a proper one. The patient claimed that when exercising he always relished a light mid-day meal better than a hearty one, and that he usually chose milk foods of some kind with fruit and chocolate. Provided ice-cream is properly made, it is nutritious, and the abstraction of heat was rather indicated than contra-indicated under the circumstances. Bananas contain a large amount of raw starch, so that they are digested in the intestine and not in the stomach. In this connection, it must be noted that not only is functional intestinal indigestion less frequently encountered than the corresponding gastric condition, but also that the temporary abeyance of the digestive powers during exercise affects the stomach rather than the intestine. Chocolate contains theobromine (dimethylxanthine), which seems to have a stimulating effect similar to that of caffeine (trimethylxanthine), of tea, coffee, guarana, etc. Perhaps because it contains less methyl, chocolate seems to produce less after-depression than coffee or tea. Bearing in mind that the average person stands in need of a fast rather than of a meal, there is much to commend the practical judgment of the bicyclist in favor of a light and almost trashy luncheon.

A friend of the writer has lately rejected an applicant for insurance on account of a heart murmur apparently dating from a strain during a long bicycle ride. Several cases of sudden death have also been reported recently, but most of these have been in the persons of old men or those with grave cardiac or arterial disease. It is, also, not rare for bicyclists to faint from excessive exertion or to succumb to mild heat-prostration. These cases, however, do not usually come to the attention of the physician, on account of his inaccessibility at the emergency. The two present cases illustrate what the writer considers the moderate and typical grade of cardiac and nervous strain of bicycling. There is nothing extraordinary in the occurrence of such cases, nor do they present any marked peculiarity to distinguish them from the results of other strains. Nevertheless, the writer has observed an apparently increased liability to digestive exhaustion, and we must bear in mind the facts that bicyclists are not, as a rule, accustomed to severe physical exercise, and that they are subjected to a combination of mechanical and mental strain which differs from the mere muscular fatigue of the majority of manual occupations.

No one, who has not experienced it, has the slightest conception of the fatigue of bicycle riding. The poetical notions that one flies through the air, that distance is annihilated without a corresponding expenditure of energy, that the sport is all exhilaration are carefully fostered by advertisements, and the grimy, sweat-lathered reality of a country ride is kept in the background. Cycling is rare sport, but it is not adapted to the delicate nor the lazy. In particular, no physician is competent to recommend it as an exercise till he has had actual personal experience with all

kinds of wheeling. It must be understood that a totally different set of muscles are called into play from those used in walking, and that, save for the general physical reserve, an accomplished pedestrian who can make his twenty-five miles a day across country is not much better adapted to wheeling than one of sedentary habits. In walking, the action of the knee is almost entirely due to inertia and only slightly to muscular contraction, while the principal work falls on the muscles of the lower leg which move the ankle. On the other hand, a properly mounted bicyclist has comparatively little ankle strain, but turns the crank mainly by the contraction of the quadriceps, a muscle whose forced action is otherwise occasioned by kicking and stair-climbing and by very few other motions. It is well understood that climbing is an exercise to be particularly guarded against in those suffering from severe pulmonary, cardiac, and vascular disease, and it should be equally well understood that wheeling differs only in degree from climbing. In fact, if we imagine a person climbing a flight of stairs with some one boosting him with a perineal saddle, we have an almost exact conception of the work of the cyclist. On down-grades, the "boost" is almost sufficient to support the whole weight of the body, on slight upward inclines it is much less, on steep grades the relative "boost" is lessened progressively, till the cyclist raises his weight free from the saddle in the ineffectual endeavor to propel his machine.

In the days of the "ordinary" and of the Star bicycle, with its levers, the rider sat almost directly over the pedals, so that muscular contraction was assisted by gravity, and the maximum exertion was in the vertical direction, into which the limb naturally straightens itself by the symmetrical action of the muscles on the alternately concave and convex angles of its joints. The early safety, though clumsily constructed, retained this important advantage. Then, following the English lead, the saddle was placed so far behind the sprocket-wheel that the revolution of the pedals required an unnatural forward thrust of the leg, while the back was arched and the chest constricted in leaning over to reach the handle bar. Against this constrained attitude a protest is just beginning to make itself felt.

Wheeling cannot be considered in the same hygienic category as walking. Mile for mile, under ordinary circumstances, the former requires less exertion. Hour for hour, unless on a down grade, it is much harder exercise, about fifty per cent. harder for the rational cyclist, double if we contrast the fast walker with the "scorcher." The strain, in one of the cases reported, is ascribed largely to a head wind. The fact that the resistance of the air is almost entirely ignored in the construction of vehicles intended for speed shows how little this element is appreciated. A wind of ten miles an hour, plus the speed of the wheelman, is a very considerable obstacle, riding against a wind of twenty miles an hour is like climbing a steep and endless hill, while a gale of forty miles an hour will render progress practically impossible.

The nervous strain of walking is almost nothing and the mind is free for recreation. "Eternal vigilance is the price of safety" for the cyclist, and any enjoyment of scenery must be had by dismounting or by snatching momentary glances at a rapidly-moving landscape. Thus the eye-strain alone becomes an important consideration, and it may well be that the especial liability to nausea and vomiting in cycling fatigue is due to this factor. The term "safety" as applied to a bicycle is only relatively correct. A header is almost impossible and other falls are reduced in height, but there is still the ever-present danger from loose stones, car-rails, curbs, and ruts, while the average driver of horses is, wilfully or through ignorance, utterly without regard for the life and limb of the wheelman. The jar of the bicycle must also be considered, and, contrary to current belief, the writer finds that the pneumatic tire is scarcely as efficient against this factor as the old-fashioned spring frame with solid tire, while there is added the constant apprehension of a breakdown through puncture of the tube.

As to the treatment of bicycle strain, little need be said in addition to the remarks in the case reports. Acetanilid is a valuable drug in the treatment of nausea and nervous depression, not only on account of its local action on nerve tissue, but because it checks fermentation, which is liable to occur in a stomach whose normal secretion is suppressed. Objection may be made to its use in any case of cardiac depression, but the writer believes that moderate doses are not paralyzant to the heart, but, perhaps, indirectly stimulating. The most important consideration in the treatment of all similar cases is the liability of a strained heart to dilate. This liability must be combated with rest for several days, the degree of enforced inactivity varying with the severity of the case. After the first indication for diffusible stimulants is met, the heart should not be medicated. A heart that is permanently or at least chronically weak may be benefited by strychnine, digitalis, strophanthus, and the like, but a heart in a state of recent strain needs rest, and not stimulation. The use of strychnine in the first case is an inconsistency not overlooked at the time of its administration, but apparently demanded by the digestive failure. Care was taken that no false feeling of strength, due to the possible action of strychnine on the heart, should lead the patient into exertions for which he was unfitted. In the second case, there being no call for a digestive stimulant, no such drug was administered.

A CASE OF TRAUMATIC CARDIAC NEUROSIS.¹

BY J. C. MULHALL, M.D.,

of St. Louis.

Miss C. W., school-teacher, aged twenty-six, when first seen, in January, 1893, was suffering from a peritonsillar abscess. On recovery she came under my care for treatment, designed to prevent recurrence of this trouble, from which she had been a frequent sufferer.

Bearing in mind rheumatism as a possible etiological factor, I examined the heart while the patient was erect and recumbent for evidence of endocardial changes, but with negative result. The patient did not remember to have had symptoms of rheumatism, and her general health had always been good. General irregular thickening of the tonsils, which were adherent to the soft palate, existed. Curette and scissors were employed with a view of removing every vestige of tonsil tissue. The patient lacked courage and permitted very little to be done at a sitting. Treatment was therefore prolonged over quite a period of time. At one visit she complained of shortness of breath, and I again examined the heart, but with a negative result. Flatulence, following a hearty meal eaten late the previous evening, explained the sighing respiration. I mention these two examinations of the heart, since they have an important legal bearing on what is to follow.

One day, three months later, she entered the office bearing the marks on her face of several superficial incised wounds. She seemed anxious and frightened, not, as she explained, because of these slight cuts, but because of a sensation in the region of the heart which she had never before experienced. It was at times that of a fluttering bird, again a sense of weight or constriction, and was accompanied by sobbing respiration, but not by true dyspnoea. As she was originally of a highly emotional temperament, her sensations had produced profound alarm within her. She stated that while occupying the most forward seat on the west side of a cable-car going northward, another car, proceeding eastward and therefore unperceived by her, had collided with the car in which she was seated, throwing her forward with sufficient violence to shatter the window-pane. She was so agitated at the time that she could not recall many details, but did not remember any concussion of the chest wall, though she recalled the fact that her heart-symptoms had occurred at once. Examination disclosed no contusion of the chest wall, nor was there any tenderness on pressure. There was no thrill on palpation, the impulse was feeble, and the apex-beat was not dis-

¹ Read before the American Climatological Association, at Hot Springs, Virginia, June 13, 1895.

placed. The pulse was small, feeble, irregular, and, even after the patient had rested fifteen minutes, ninety per minute. The pitch of the pulmonic sound was higher than that of the aortic, its intensity equal. In the mitral area the first sound was feeble, and accompanied by a loud murmur. As one approached the axilla and angle of the scapula the first sound was lost, being entirely replaced by the murmur. It bore the characteristics of an hæmic murmur, but was of much greater intensity.

She was ordered to rest from her work, and given tincture of strophanthus in five-drop doses four times daily. At the end of a week the pericardial anxiety occurred at longer intervals, and she was able partially to resume her duties. At the end of three months she had no subjective symptoms, except when she allowed herself to be overworked or when she participated in some emotional disturbance, at which time either the sense of constriction or some tumultuous action of the heart was observed. The murmur was of much less intensity. At the end of six months all subjective symptoms had ceased and the murmur could only be heard, the patient recumbent. To-day, fifteen months from the time of the accident, no abnormal physical signs or symptoms exist.

Six months from the date of injury, the patient, through her lawyer, presented a petition for damages, asking for seven hundred and fifty dollars, alleging loss of service and much physical suffering, with grave anxiety pending the outcome of the heart affection. The facts in the case proved negligence. My medico-legal brief recited the important fact of acquaintance with the condition of the heart before the date of injury, and the facts in the case immediately and remotely subsequent. My opinion was also stated that not only was there a general traumatic neurasthenia incident to railway collisions without discoverable marks of violence, but that this unstable nervous condition might be confined to one organ, as, for example, the heart. Malingering was out of the question, for, though she might deceive us as to subjective suffering, she could not produce a mitral regurgitant murmur. She was, without suit, awarded the damages asked for.

The murmur in this case can hardly be explained on any other hypothesis than that there existed dilatation of the left ventricle and consequent non-approximation of the mitral segments, the result of a functional paralysis of certain cardio-motor nerves.

REVIEW OF MEDICINE.

MEDICINE.

IN CHARGE OF JOHN H. MUSSER, M.D.,

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AND

J. A. SCOTT, A.M., M.D.,

Physician to the Out-Patient Department of the Pennsylvania Hospital; Assistant Demonstrator of Morbid Anatomy in the University of Pennsylvania.

A Case of Local Variola. (*Von Graefe's Arch. f. Ophthalm.*, vol. xli., No. 1.) By A. Wagenmann.

A woman, thirty-three years of age, while bathing a sister sick with variola, sprinkled some of the water in her own face and right eye. She had been vaccinated successfully in her first, eleventh, and twenty-first years. On April 27, seven days after the accidental inoculation, the right eye began to itch, on the 29th there was slight reddening, on the 30th there was swelling of the lid and injection of the ocular conjunctiva. Later the lower lid became everted, and two yellowish-white spots the size of the head of a pin appeared, one on the edge of the lid, the other on the tarsal conjunctiva near the beginning of the fold. Opposite the inner pustule the conjunctiva was red and thickened, and on the following day two ulcers appeared at the point of contact. On one day, May 3, the temperature rose to 39° C. On May 11 these pustules had completely healed, but others were appearing on the body.

The incubation period was about five days, while in true small-pox it is twelve. This deviation and the aborted course the author thinks are due to partial immunity, for inoculation into the skin may cause the appearance of a vesicle in from four to eight days, or if the person has been successfully vaccinated several times no vesicle is formed.—*Centralblatt für Bakteriologie und Parasitenkunde*, October, 1895.

Symptomatology of Cutaneous Actinomycosis. (*Journal des Sciences médicales de Lille*, August 31, 1895.) By Dr. F. Monestié.

In the course of a dental caries, or following a small wound, the patient becomes aware of a movable, rounded, regular tumor, which seems to be situated in the subcutaneous cellular tissue. This tumor may have arisen without known cause, or it may have made its appearance after the patient had eaten an ear of corn or after he had scratched himself with a finger

which was soiled by pus from a focus of actinomycosis. The patient can feel the tumor in the mouth, but it is clearly independent of the mucous membrane. In nearly all cases the tumor gives rise to neuralgic pains, which the patients voluntarily call toothache, but these pains are not clearly localized, and are even felt in the head. When the onset is sudden the patient thinks he has an inflammatory affection of the tooth, but this trouble, instead of improving at the end of a few days, gains ground steadily, and at the end of a month or two has increased in volume, and has begun to be perceptible from the external surface. The tumor also becomes adherent to the derm, which is insidiously inflamed. The skin lesion appears in a gummatous and in an anthracoid form. In the gummatous variety there are cavities resembling tuberculous or syphilitic gummata, containing considerable pus. Each cavity opens by a small number of fistulæ. In the anthracoid variety a very large number of fistulæ are present; from these a small quantity of pus escapes, the pus is not clearly massed at one point, and the whole lesion resembles a sieve. The skin is at first rose-colored, then red, and finally becomes wine-red. The epidermis of the affected regions desquamates in fine scales, particularly at the margins. Blackish crusts form here and there from the hardened pus and dried blood. These are free at the margins and adherent at the centre, and they obliterate a fistula. As these crusts detach themselves gradually, a crop of gelatiniform, translucent, semi-transparent, flabby granulations springs up. These crusts often give a tuberculous character to the lesion. There are numberless projections separated by furrows, which, on the one hand, are shallow and numerous, and, on the other hand, are deep and few. The deep furrows formed by the union of smaller furrows mark off large tubercles. Derville has described certain spots which he considers pathognomonic. These spots are more or less deep in color according as the general color of the lesion is more or less pronounced. If the general color is pale, the spots are bluish-red or violet; if the tint of the mass is deeper the spots present a blackish or slate color. These spots vary in size from that of a pea to that of a pin's head. In form they may be regularly rounded, and in the centre there is a white point, resembling a point of folliculitis. The epidermis near these spots seems to cover the granulations, and the translucent appearance which the lesion presents at this level is due to the intimate relation between the epidermis and the flabby fungosities which form the actinomycotic mass. These spots appear to correspond to the points at which the wall of the abscess is thinnest. The examination of these lesions by palpation reveals a central, superficial zone, which is projecting and which is flabby, distinctly elastic, and tender to the touch, and a peripheral, deep zone surrounding the central zone, which is very resistant, of a woody hardness, and begins from one to two centimetres from the circumference of the central part, and reaches a thickness of a half centimetre. The central zone gives the sensation of a very thin skin raised up by fungoid masses, and it is here alone that fistulæ form; in certain parts a

sensation of fluctuation may be detected, but it is not clear, and always suggests the fungous masses. The peripheral zone sometimes appears to adhere to the deep parts, and at other times it is limited to the subcutaneous cellular tissue; it does not project above the surrounding parts and its color is a little less marked than that of the centre of the lesion. A characteristic sero-purulent fluid is discharged from the lesion, which contains solid particles mixed with blood. If this fluid is collected in a small glass tube, the liquid part will go to the bottom of the tube, and the solid parts will adhere to the sides. The solid part is of the nature of little grains of a brilliant, sulphur-yellow or yellowish-white color, about as large as the head of a pin. These grains are clusters of actinomyces. Pain is practically the only subjective symptom. This may arise spontaneously by the formation of new fistulæ or it may be started up by pressure. Cutaneous actinomycosis is less debilitating than is actinomycosis of the viscera; but it has a bad effect, either directly or indirectly, upon the whole economy. In all cases a few painless and distinctly enlarged lymphatic glands have been found. The adenitis is not constant in its situation, being at times bilateral, at times situated on the same side as, and again, on the opposite side to the lesion. Cutaneous actinomycosis affects the face usually, and is seen in the hands next in order of frequency.

Santini's Hydatid Resounding or Booming as a Diagnostic Sign of Multiple Hydatid Cysts. (*Australasian Medical Gazette*, August 20, 1895.) By Thomas Fiaschi, M.D., of Sydney.

Hydatid resounding or booming was first described by Dr. Santini, an Italian, under the name of *sonorità idatigena*. The sound is described as being elicited by auscultatory percussion of a suspected hydatid cyst, and as having a sonorous booming character, of low tone, brief, and ending in a rapid manner, *rimbombo sonoro*. It is compared to the sound obtained on percussing a membrane stretched on a metallic frame. The author has looked for this sign in all cases of abdominal hydatids which he has seen, and concludes that this special sound exists. It is a valuable addition to the semeiology of hydatid disease, and may be the means of preventing many useless exploratory incisions. It will be valuable in differentiating between hydatid cysts and other soft, smooth, and elastic abdominal growths, such as soft sarcomata. It will also enable one to distinguish between single and multiple cysts. In the former condition the hydatid resounding will be uniform in tone, no matter what point of the tumor is percussed. In the latter condition, if percussion is made over a cyst to which the stethoscope is not applied, the hydatid resounding will be different in tone from that elicited by percussion on the same cyst as that over which the stethoscope is applied.

A Case of Aneurism of the Heart and a Probable Diagnostic Sign of such Condition. (*Australian Medical Journal*, August 20, 1895.) By E. H. Embley, M.B., B.S. (Melb.), of Melbourne.

The case reported presented an increased area of cardiac dulness and the presence, on auscultation, of a musical sound, quite distinct from the normal sounds and obscuring them. This sound was humming in character, high in pitch, continuous throughout the entire cardiac cycle, rising in systole and falling in diastole, and audible from apex to base, but loudest at the apex. The distinctly uninterrupted continuity, the easy rise and fall, the absence of see-saw indications of a backward and forward flow, and the high pitch of the musical sound denoted a small tag of substance vibrating in a continuous current and increasing in the intensity of its vibrations with the increase of intracardiac pressure. The patient died, and at the necropsy a small, ragged opening was found in the posterior wall of the left ventricle, in an aneurismal dilatation of the wall of the ventricle. In the light of the autopsy the explanation of the abnormal sound is easy. The unemptied portion of the heart, in which the gyrations of blood occurred that caused the continuous vibrations, was the aneurismal dilatation, in the thin wall of which the perforation occurred. Although the presence of a tag of substance, so situated in the aneurismal sac as to vibrate in the above mentioned manner, is rare; yet, when it is met with, it should indicate a heart cavity unemptied at the end of its systole and an aneurism.

New Methods of Diagnosis and Treatment of Diseases of the Stomach and Intestines. (*American Medico-Surgical Bulletin*, July 1, 1895.) By Fenton B. Turck, M.D.

The *gyromele* consists of a flexible cable, to the end of which is attached a sponge, covering a spiral spring. The cable passes through a rubber tube, and this again is attached to a revolving apparatus not unlike a surgical drill, for the purpose of producing revolutions of the sponge. This is introduced into the stomach for diagnostic and therapeutic purposes. For exploring purposes the instrument is introduced into the œsophagus, sigmoid, bladder, or any cavity. For the purpose of exploring strictures of the œsophagus, ivory bulbs are attached. The indications for its use in the stomach are: the removal of adherent material from the walls; the application of antiseptics and medicaments; direct internal massage of the walls of the stomach; the application of an electrode to the entire stomach, so that every part of the organ is reached.

The author devised the *gastric motor meter* for determining the contractility and movements of the stomach. It consists of a small rubber tube, to one end of which is attached a small oblong rubber bag. The collapsed bag is introduced into the stomach, and when inflated is connected with a manometer and a recording cylinder which gives a tracing curve of the various movements.

The *stomach needle-douche* consists of a double tube,—a small, short tube with a perforated ball at one end to be introduced into the stomach, and a larger tube for the immediate return of the water. This instrument is introduced into the stomach so that the perforated ball passes just beyond the

cardiac opening. The stomach is now inflated with air to distend it, and a strong force of water is passed through the smaller tube, which projects the shower, and returns immediately through the larger tube. The advantages of this process of cleaning the stomach are : it removes material from the walls ; water returns at once, avoiding over-distention and weighting down of the stomach with water. It is a vasomotor stimulant.

The *nebulizer* is used for coating the stomach with a fine cloud of the essential oils and other medicaments. It consists of a nebulizing bottle connected with an extra bottle, to which a double tube is attached. The inner tube extends into the stomach, the outer tube extends only to the cardia.

A *stomach-tube filter* is used for the purpose of withdrawing fluid from the stomach in cases of hypersecretions.

Alcoholic Disease of the Heart. (*British Medico-Chirurgical Journal*, June, 1895.) By Theodore Fisher, M.D., London.

It is only within the last few years that alcohol has been suspected of producing a definite cardiac disease. Bollinger, of Munich, appears to have been the first to attribute the cases of large heart for which no recognized cause of hypertrophy could be found to over-indulgence in alcohol, and other writers have since supported him in his conclusion.

A history of symptoms of heart-failure, lasting from two to three years, is usually given in these cases, although in some instances dyspnœa has been present only two or three weeks before the patient came under observation. Apart from the occasional presence of unusually well-marked cyanosis these cases do not differ materially from other cases of heart-failure, the same dyspnœa and orthopnœa and œdema of the legs being present. The physical signs indicating a large heart, such as increased dullness and a displaced impulse, are usually found. A systolic apex-murmur is common, owing to dilatation of the mitral orifice with the left ventricle, and dilatation of the right ventricle may give rise to a tricuspid murmur. In some cases where no murmur is present a triple sound may be heard, and in still others the sounds may be quite normal. The pulse is generally of low tension, is often irregular, and usually of increased rapidity. The liver is commonly enlarged.

In the diagnosis of alcoholic disease of the heart from the large heart associated with valve-disease, kidney-diseases, or affections of the heart muscle, it is well to remember that fatty degeneration rarely, if ever, exists as the only heart lesion. In fibroid disease severe cardiac pain is a common symptom, and sudden death is a frequent occurrence.

If the heart-failure be gradual the clinical signs are the same as in alcoholic disease of the heart, and apart from a history of intemperance it is almost impossible to make a diagnosis. In the heart-failure of hypertrophy associated with Bright's disease the presence of a high-tension pulse may render some aid in diagnosis ; but this sign may fail, and a pulse of re-

markedly low tension be present. When it is necessary to distinguish cases of alcoholic enlargement of the heart in which a mitral systolic murmur is heard, from cases of mitral stenosis in which the same murmur only is audible, the following points may be of value: Mitral stenosis generally leads to death before the age of thirty-five, whereas alcoholic disease occurs most commonly after that age. Mitral stenosis is most common in women; alcoholic disease in men. The history of rheumatism or chorea on the one hand, and of over-indulgence in alcohol on the other, may also aid us in arriving at a correct conclusion.

Two Cases of Primary Chancre of the Nasal Septum. (*Revue de Laryngologie, d'Otologie, et de Rhinologie*, July, 1895.)

The first case was that of a man twenty-two years of age, who presented himself at the clinic of the Croix-Rousse complaining of an obstruction in the right nares. On examination, an elliptical, depressed ulcer covered with a brownish crust was found on the inferior portion of the septum. The mucous membrane was swollen and caused almost complete occlusion. A diagnosis of chancre of the septum was made. The tonsils showed mucous patches and the right submaxillary was enlarged.

Two months previously the patient had suffered with pain in the right parotid at the angle of the jaw, which was followed by the appearance of the ulcer on the septum and swelling of the submaxillary. In about four weeks nocturnal headaches came on, and in the sixth week a cutaneous eruption appeared.

The second case presented an ulcer of the left nares with complete occlusion. The patient complained of persistent headache. He was first seen on May 15, 1894. On July 18, mucous patches were found in the throat and a roseola on the body.

In both cases no history of infection could be elicited and lesions were not found on the genitals. The interesting points are the situation of the ulcer and the mode of introduction of the virus, which was probably by the fingers.

THERAPEUTICS.

IN CHARGE OF ALEXANDER D. BLACKADER, B.A., M.D.,

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ASSISTED BY

D. J. EVANS, M.D.

The Treatment of Goitre and Exophthalmic Goitre by Thyroid Extracts and Desiccated Thyroids. (*New York Medical Journal*, September 7, 1895.) By E. Fletcher Ingalls, M.D., and Henry G. Ohls, M.D., of Chicago.

The author reports six cases of goitre, occurring in his own practice,

which were treated with thyroid extracts and desiccated thyroids. In addition to these he has received reports of forty-four cases by personal letter, making a total of fifty cases. Of these cases the swelling was reduced in thirty-eight cases; the swelling was not affected in eleven cases, and there was no report in one case. The symptoms noted after the administration of this remedy have been headache, trembling, rapid pulse, weakness, back-ache, nausea, nervousness, and uterine contractions. Twenty-five patients lost in weight and two gained in weight. One case is reported as having been improved mentally. From the history of the subject and analysis of the cases we may conclude: First, that thyroid products produce marked physiological effects upon the nervous and circulatory systems. Second, some of the unpleasant symptoms usually occur when a daily dose is reached corresponding to one and a half or two entire thyroid glands of the sheep. Third, if the administration of the remedy in doses that cause such symptoms is continued for a few days, constitutional symptoms are produced which indicate the possibility of fatal results. Fourth, desiccated thyroid glands appear quite as active as the liquid extracts, and they are more stable. Fifth, internal administration appears quite as effective as hypodermic medication. Sixth, for internal use, the dose for an adult should not exceed two grains three times daily at first. Seventh, the remedy, in some cases, has a pronounced effect on the body weight, but this is uncertain and variable. Eighth, the remedy has certain value in the treatment of myxedema. Ninth, in exophthalmic goitre the remedy causes a rapid reduction in the size of the gland, but it has no perceptible effect upon the exophthalmia, and it apparently aggravates the heart symptoms. Tenth, in cases of goitre improvement or cure may confidently be expected in seventy-six per cent. of the cases. Sufficient time has not elapsed, however, to determine what the final results will be. It is probable that cystic growths in the thyroid gland would not be influenced. Eleventh, clinical experience would indicate that further experimentation in other directions is advisable.

Ferripyrin for Hemorrhages from the Gums. (*Therapeutische Monatshefte*, 1895, No. 7.)

In bleeding from the gums after extraction of teeth Frohmann, of Berlin, has used ferripyrin with good results in over one hundred cases. In the case of the lower jaw a small amount of the powder is sprinkled over the bleeding surface from a small spoon; in the upper jaw a small pencil of cotton is moistened, dipped in the powder, and applied to the spot. One application is usually sufficient, and the pain is diminished, probably due to the action of the antipyrin.—*Excerpta Medica*, 1895, vol. v., No. 1.

Resorcin for Frost-Bite. (*Monatshefte für praktische Dermatologie*, 1895, vol. xxi., No. 4.) C. Boeck, of Christiania, recommends highly the following prescription for frost-bites.

R Ichthyol,
 Resorcin,
 Acid. tannic., āā 1.0;
 Aq. dest., 5.0. M.

Sig.—Apply with a brush every evening.

The drawback to the use of this combination being that the hands are blackened and dirty looking. The resorcin can be applied as follows :

R Resorcin, 2.0;
 Mucil. acaciæ,
 Aq. dest., āā 5.0;
 Talk. pulv., 1.0. M.

Sig.—Apply to the affected area.

In very rare cases the resorcin is not well borne by the patient.—*Excerpta Medica*, 1895, vol. v., No. 1.

The Therapeutic Value of Water in the Treatment of some Nervous and Mental Conditions. (*Medical Record*, September 21, 1895.) By Horace Phillips, M.D., of Philadelphia.

The physiological effects of heat, when applied to the surface of the body, are a partial vasomotor paralysis with a consequent dilatation of the whole capillary system, an increased pulse which becomes less tense and more rapid from a fall of blood-pressure, a general condition of passive hyperæmia with a decidedly increased activity of the skin. The urine is found to be scanty and to contain a less amount of urea. The temperature of the body will be found to have increased while the patient is in the bath, but it rapidly falls when the patient is withdrawn, due to the increased area of blood exposed in the congested vessels. The physiological effects upon the vascular and nervous systems produced by cold are : first, the stimulation of the vasomotor system and an exaltation of the spinal reflexes with a contraction of the terminal blood-vessels, slowing of the current of blood, a diminution of the number of corpuscles, and a gradual paling of the tissues. Dilatation of the vessels then ensues, due to a partial paralysis of the vasomotor system, with an accumulation of blood in the terminal vessels, causing a cyanotic condition of the surface. The pulse falls quite perceptibly, due to the stimulation of the inhibitory cardiac nerves, and this is associated with a decided fall in blood-pressure. The respirations become slower, the secretion of urine is scanty, and the liver and deeper structures become congested. The temperature of the surface falls. The proper temperature for a hot bath is between 98° F. and 128° F.; that of a cold bath should be between 50° F. and 70° F.

Lower temperatures are better borne, and the reaction is more prompt when exercise, either by massage or by muscular exertion, is practised, but not carried to the point of fatigue. No influences should be exerted which tend to demand an increased local supply of blood; hence no food should be taken before a bath, and the same is true of alcohol or other stimulant.

In persons of tender years and in those who are advanced in life or who are suffering from organic disease of any vascular or excretive organs, the warm bath, 70° F. to 95° F., embraces most of the beneficial effects which are derived from the cold bath with but few of its dangers. Neurasthenic conditions are susceptible to benefit from the action of water. The lack of tone, increased excitability, and a tendency to rapid fatigue of the muscular system would, one and all, be benefited by the bath. Although the cold bath would seem to be indicated in such conditions, the impaired physical condition would contra-indicate its use. The warm bath is generally applicable in melancholia, it has done excellent service in acute mania, and it is to be recommended in chronic mania, dementia, and epilepsy. Cold baths have been strongly urged in the acute stages of general paralysis.

On Septentrionalin as an Anæsthetic and Substitute for Curare in the Performance of Vivisection. (*British Medical Journal*, September 14, 1895.) By H. V. Rosendahl, of the University of Upsala.

Rosendahl has isolated from *aconitum lycoctonum* (L.), growing in Sweden, three alkaloids; one of these, septentrionalin, appears to be of practical use, especially to the experimental physiologist and pharmacologist. This drug is a white or slightly yellowish powder of a bitter taste, producing after a short time a local anæsthetic effect. Fusion point, 128.9° C. Rotates light to right. Soluble in 1.7 parts of alcohol, in 2.1 parts of ether, and in 58 parts of water. Given *per os*, the septentrionalin produces no general poisonous effects. Subcutaneous or intravenous injection is followed by increased salivation and sometimes nausea, never by vomiting. By its use the sensory nerve-endings are paralyzed, and it may, for that reason, be used for obtaining a local or general anæsthesia. A motor peripheral paralyzing action follows the paralysis of sensibility, during which the animal lies quite motionless, and, if the dose be large enough, is free from all reaction during any operation. The respiration ceases first, the heart being the *ultimum moriens*. If artificial respiration be employed the animal is kept alive and well in consequence of the rapid elimination of the poison, and soon recovers without any signs of the animal's health having been influenced in any way by the intoxication. After injecting the minimum quantity of septentrionalin the blood-pressure sinks immediately, but only for a moment. If a deep intoxication be maintained by frequent injections the rate of the pulse is considerably diminished, while at the same time the contractions of the heart continue for a long time with undiminished force.

Tetanus produced by strychnine yields immediately both in frogs and warm-blooded animals by injections. Abnormal post-mortem appearances are reduced to subpleural ecchymoses and engorgement of the blood-vessels in the abdominal organs. The toxic dose required for curarization is, per kilogramme of body-weight,—for frogs, 0.000174 to 0.0005 gramme; for dogs, 0.007 gramme; for cats, 0.01 gramme; for rabbits, 0.003 to 0.005 gramme, and for fowls, 0.009 gramme.

Report on Eliminative and Antiseptic Treatment of Typhoid Fever. (*Medical Record*, September 14, 1895.) By W. B. Thistle, M.D., of Toronto.

This is the third report on this method of treating typhoid fever that Dr. Thistle has made since 1893. If we recall the fact that bacteria bring about disturbance by virtue of the toxic substances which they produce, we will perceive clearly that the condition in typhoid is one of continuous intoxication. The primary and chief source of the poison is the alimentary canal, although some portion of the toxæmia must be attributed to poison elaborated by bacteria which have been carried from the intestine and deposited in the various tissues in the body, notably the lymphatic nodes of the intestine and mesentery. Locally, the typhoid toxin will irritate tissue cells and produce swelling, congestion, and irritation of the parts. If it becomes concentrated to a sufficient degree, the irritation is replaced by complete destruction or necrosis. The necrosis may be brought about not so much on account of the concentration of the poison as on account of the long continuance of contact. The general symptoms are increased or diminished according to the amount of poison in the body. The extent or degree of local lesion is determined by the degree of concentration of the poison and the duration of contact. The infection, whether it is due to the Eberth bacillus or to a modified colon bacillus, comes from without and takes on active growth in the small intestine. Considering these facts in relation to the cause and characteristics of this infection, the indications seem to be elimination, antiseptics, and dilution. Elimination is accomplished by free and continuous purgation as well as by the flushing action of large quantities of water on kidneys and bowels. By the use of purgative medicines bacilli are carried out of the intestine, together with the toxic substances produced by them. Poison held in solution by the body fluids escapes with the free secretion into the intestine, and a quantity of extremely toxic bile is swept away instead of continuing in the circuit from the liver to the intestine and back again. If constantly relieved in this way, the liver can more frequently perform its rôle of standing guard and intercepting toxic substances which would otherwise reach the general circulation. Infection of the intestinal glands is limited, or, in other words, the source of supply from which bacilli and poison are carried from the intestine is cut off. By repeating this process a dangerous accumulation of toxin in the system is prevented, and at the same time it tends to prevent local lesion in the intestine from becoming sufficiently great to destroy a vessel or to extend entirely through the intestinal wall. There can scarcely be a doubt about the possibility of destroying micro-organisms in the alimentary tract to some degree by antiseptics. But to be efficient antiseptics should be used in association with purgatives, for the following reasons: 1. Just as it is easier to approximately sterilize an abscess cavity after having emptied it, so is it to derive benefit from intestinal antiseptics if the intestine be first cleared of its contents. 2. Intestinal antiseptics, while lessening the production of poison by destroying

bailli, yet could have no possible effect on the poison already in the intestine, but in many instances might themselves add to the toxins present. 3. Much larger quantities of antiseptics can be used without poisonous symptoms arising if, at the same time, elimination by the bowels is continuously maintained. Any benefit derived from an antiseptic is obtained at once, and if it is speedily cleared away much which would otherwise be absorbed escapes with the contents of the bowel. Dilution is clearly indicated, for the local effect of the poison depends upon its degree of concentration as well as upon the duration of contact. Purgation at no time causes perforation or hemorrhage, but at all times tends to prevent its occurrence. The author reports one hundred and seventy-two cases, with a mortality of five,—or three per cent. No death from toxæmia and no perforation. Hemorrhage in eight cases, including two fatal cases. Tympanites never developed during treatment, and, where present at first, invariably disappeared as soon as elimination was freely secured. Delirium practically unknown after the first days. Out of sixty-four charts in the possession of the author, fifty-eight show that the highest temperature reached was in the first three days. The pulse improves with the general symptoms. Diarrhœa never required controlling treatment. Catharsis was produced by three or four grains of calomel in divided, half-grain doses, followed by a saline in three or four hours. Other cathartics or salines may be used. Elimination should be secured quickly. Four cases with their accompanying temperature charts are reported.

SURGERY.

IN CHARGE OF HENRY R. WHARTON, M.D.,

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The Operative Treatment of Hernia. (*American Journal of the Medical Sciences*, July, 1895.) By W. S. Halsted, M.D., of Baltimore.

In the treatment of hernia the problem is to close a rent in the abdominal wall and to provide for the safe transmission of the spermatic cord. The cord is the first cause of the hernia and the ultimate obstacle to its cure. A reduction in the size of the cord would lessen the liability of the hernia to recur, and the cord may be reduced to less than one-third its original size by excising the superfluous veins. In closing the abdominal wall the incision is continued through the internal oblique and transversalis muscles for about an inch, and the upper fibres of the cremaster, together with the

cut fibres of the internal oblique and transversalis muscles are included within mattress sutures in the same manner as other abdominal wounds are closed. There are usually six of these deep stitches, which are taken not more than one centimetre apart. The vas deferens, with its arteries and remaining veins, is brought forward between the two outermost stitches, which are closer together than the others, and which embrace the cord snugly. When the deep wound is closed, muscles should be seen throughout the greater part of it, projecting between the cut edges of the aponeurosis of the external oblique muscle. These edges are then made to embrace the cord more snugly at the point where it passes between them by two very fine stitches. The skin incision is closed with an uninterrupted suture. The cord by these proceedings is transplanted so that it lies superficial to the aponeurosis of the external oblique. Silver wire is used as a suture material, and the wound is covered with silver foil. This has an inhibiting influence on the growth of bacteria.

A Case of Cancer of the Urethra. (*Boston Medical and Surgical Journal*, September 26, 1895.) By A. T. Cabot, A.M., M.D., of Boston.

The author reports a case of primary cancer of the urethra which originated from the mucous membrane of the urethra. The tumor was separated from the skin by a wide interval, and did not extend beyond the perineal portion of the urethra in any direction. The tumor occurred in a man who had suffered from gonorrhœa, and who had also had an abscess in the perineum. The case was treated as an abscess at first, and the tumor was found on a second operation for its relief. Microscopic examination showed it to be a small, cylindrical-celled cancer.

Sigmoido-Proctostomy: Anastomosis of the Lumen of the Sigmoid Flexure through the Lateral Wall of the Rectum at the Pelvic Floor without Suture. (*Mathew's Medical Quarterly*, July, 1895.) By Howard A. Kelley, M.D., of Baltimore.

The operation was done for the relief of an artificial sigmoid anus, consisting in the anastomosis of the sigmoid flexure into the lower part of the rectum on the pelvic floor by means of traction sutures passed through the severed sigmoid, pulling it into a slit in the rectum, and bringing it out at the anus. The operation was begun by dissecting out the entire scar on the abdominal wall containing the sigmoid and rectal orifices; these were then separated and each wrapped separately in gauze and laid aside. The incision was now lengthened and the enucleation of the inflamed pelvic structure begun. Three centimetres of the upper part of the strictured rectum were removed, severing it below a rupture in its walls and then approximating the wedge-shaped flaps with silk sutures, and closing its lumen. This rested on the right side opposite to the second sacral vertebra. The end of the sigmoid was then caught with six long, silk traction-sutures passed through the peritoneal and muscular coats, enter-

ing about one-half centimetre from the edge of the incision and emerging on the incision within the mucosa. The walls of the bowel were from three to four millimetres thick, and were somewhat rigid. An oblique incision was made into the rectum on the pelvic floor, just above and behind the vagina, close to the cervix, and below the lower end of the stricture. The incision was about three centimetres long, was directed from before backward and from left to right, and was made through the abdominal incision. A pair of long artery-forceps was then passed through the anus and ampulla and out through the incision in the rectum, and the traction-sutures were caught in a bunch, pulled down and out of the anus, thus drawing the sigmoid into the rectal incision. The bowel was kept from slipping back into the pelvis by grasping the sutures in the heel-bite of the forceps as they lay in the gluteal furrow across the anus. A rectal examination showed that about one centimetre of the sigmoid projected into the rectum. The fit of bowel into bowel at the incision was so snug that the line of division between the sigmoid and the rectum could not be detected. No sutures were used between the sigmoid and the rectum. The pelvis was irrigated and packed with gauze, and the incision in the abdomen was closed except at the point at which the gauze protruded. After the operation, faecal matter at no time passed by any other than the natural route.

Erasion, Excision, and Amputation in Joint-Disease. (*Journal of the American Medical Association*, August 3, 1895.) By De Forest Willard, M.D., of Philadelphia.

When operative measures are demanded, erasion is the preferable procedure, as it gives less subsequent deformity and results in better locomotion. This operation is especially applicable at the ankle, wrist, and shoulder, frequently at the knee and elbow, rarely at the hip.

Excision is most useful at the hip. It is also largely employed at the knee and elbow; more rarely at the other articulations.

Amputation should be employed in rapid and extensive degenerations at the ankle, knee, wrist, elbow, and in old hip cases which have relapsed after excision.

In children, the less mutilatory operation should be first employed, even though repetition is required; but in adults, temporary operations are seldom advisable.

The necessity for operative treatment in joint-disease arises from neglect of proper mechanical measures. Protection and fixation of the joint in the early stages of tuberculous invasion will nearly always result in a cure with a movable joint and good function. These measures together with anti-bacillary injections and cataphoretic in-driving of iodoform are steadily decreasing the number of cases demanding operation. Motion and traumatism are the chief causes of inflammatory complications in tuberculous osteitis, and often result in such an amount of suppuration and loss of bone as to demand removal of the diseased tissues.

A Report of Fourteen Cases of Dislocation of the Ulnar Nerve at the Elbow. (*American Journal of the Medical Sciences*, October, 1895.) By H. R. Wharton, M.D., of Philadelphia.

The author reports a case of dislocation of the ulnar nerve so that it could be felt as a cord lying in front of the internal condyle of the humerus. Thirteen other cases have been reported, and from a study of these the author concludes that the affection is rare when it occurs independently of fractures or dislocations of the bones of the elbow. That it may result from direct violence or from muscular effort causing laceration of the fascia which holds the nerve in its groove at the back of the internal condyle of the humerus. That the symptoms are usually more marked immediately after the injury than at a later period. That very little permanent disability follows. That in very rare instances a neuritis develops. That the nerve should be replaced and retained in position in order to avoid this sequel. That the most satisfactory method of treatment is to expose the nerve and fasten it in a bed, made for it in the fibrous structures behind the internal condyle, by kangaroo-tendon sutures. That treatment by pads and splints does not permanently reduce the dislocation.

Practical Urethroscopy. (*Medical Record*, September 7, 1895.) By H. R. Wossidlo, M.D., of Berlin.

The diagnosis of chronic gonorrhœa is generally based upon the following symptoms: Occasional or constant appearance of a small quantity of muco-purulent or mucous discharge, especially in the morning; filaments in the urine; and principally on the presence of gonococci in the secretion or in the filaments. Microscopical examination of the discharge for gonococci and leucocytes is an effective means of diagnosis and is requisite in every case of chronic gonorrhœa. But the presence of gonococci in the secretion is not constant, and the filaments and discharge may be examined for a long time without finding gonococci. If the patient be then dismissed as cured he may be still liable to infect his wife. The presence of filaments in the urine warrants the conclusion that desquamation and inflammatory exudation are still taking place, but their presence does not prove that the discharge is still infectious. If we remember the evil consequences of gonorrhœa in women as well as in men it cannot be permissible to neglect even one means of confirming the diagnosis. The urethroscope is necessary for the diagnosis of chronic gonorrhœa. The instrument described in the article is the Nitze-Oberlaender urethroscope. The endoscopic tubes are made of silver, having a calibre of twenty-three, twenty-five, twenty-seven, twenty-nine, and thirty-one Fil. Charrière. The light-carrier consists of two wires which conduct the electric current to platinum wires. One of these wires is tunnelled, the other is not, and they both rest on a tunnelled bar, through which cold water circulates. The urethral tube is armed with an obturator, which is straight for the anterior urethra and jointed to assume the shape of a Mercier catheter for the posterior urethra. As accessory instruments are:

a dilating tube with two blades, an endoscopic sound, a capillary aspirator, a spatula for removing mucus from the glands. Instruments for endoscopic treatment are: the endoscopic knife, the endoscopic canula, armed with a syringe for injections into the urethral glands or other orifices, an anterior urethral forceps, an electrolytic sound, and an instrument designed for internal urethrotomy. Before introducing the tube into the urethra, every part of the apparatus should be tested to show that it is in working order. Thorough examination of the urethra depends upon the neat adjustment of all parts of the apparatus. This being in perfect working order, the patient is told to empty his bladder. Any urethral discharge that may be present having been washed away with a syringe, the patient is placed on the examination-chair. If the patient be very sensitive, it will be advisable, before introducing the urethral tube, to inject one or two grammes of a three- or five-per-cent. solution of cocaine. The tubes must be lubricated with ten- or twenty-per-cent. boro-glycerin before passing them into the urethra. In case a stricture prevents the introduction of the tube, it is better to withdraw the instrument and after dilating the stricture to reinsert it. If the meatus be too narrow for the passage of the tube the defect may be remedied by dilatation or meatotomy. After the endoscopic tube is introduced to the bulb, the obturator is withdrawn. All superfluous glycerin, mucus, or blood has to be removed with cotton, twisted round a probe, in order to prevent steam from disturbing the electric light. The urethra being dried, the light-carrier is put into the tube, and the mucous membrane which presents at the end of the tube is examined; successive portions may be examined as the tube and light are slowly withdrawn, taking care to keep it in the urethral axis. The light does not make the tube unbearably hot. The endoscopic appearance of the mucous membrane of the urethra varies according to the calibre of the passage, according to the blood-supply, and according to modifications brought about by the pressure of the endoscopic tube and by the application of cocaine. In looking through the urethroscope the first thing seen is a more or less highly-colored disk of mucous membrane, which, closing over the objective end of the tube, forms a funnel or circle, presenting a rim, a central figure, and an intervening surface. The central figure is the lumen of the urethra, its shape varying from that of a dimple to that of a T-figure. A number of longitudinal folds radiate from the centre of the mucous membrane, and these are of diagnostic importance, their thickness indicating whether or not they are infiltrated and to what degree. In drawing out the endoscopic tube the openings of the urethral glands present as red, depressed specks or small slits, of the calibre of a pin's head, along the roof, the surrounding mucous membrane being normally smooth or slightly elevated. Very prominent or gaping glandular openings surrounded by a deeply-colored mucosa indicate pathological conditions. In studying the anatomical changes of chronic urethritis we find alterations of the epithelial layer and pathological changes of the urethral

glands. The salient histological feature in chronic urethritis is cellular infiltration of the subepithelial connective tissue. In the milder forms we find the subepithelial tissue impregnated with a more or less dense infiltration consisting of mononuclear or epithelioid cells or leucocytes. If these cellular infiltrations cause only a swelling and hyperæmia of the mucous membrane, with no tendency to transformation into hyperplastic connective tissue, the condition is diagnosed urethritis mucosæ. The second form of chronic urethritis is characterized by a denser and deeper cellular infiltration, containing not only leucocytes, but also numerous young connective-tissue cells. The increasing fibrous tissue finally forms a callous cicatricial girdle around the lumen of the urethra. We call this form a real infiltration (*herdinfiltrat*).

The urethral glands are visible in all forms of chronic urethritis. In the milder degrees of inflammation their orifices appear as small red specks with swollen, puffy walls, and now and then a watery, milky, or purulent discharge oozes from them. In the severer forms of gonorrhœal disease the orifices of the glands gape and are often surrounded by a puffy, red, and prominent wall. Urethroscopy of the posterior urethra is contra-indicated in all cases of acute or subacute posterior urethritis, in tuberculous cases, and in hypertrophy of the prostate. The Nitze-Oberlaender urethroscope guides treatment by dilatation and enables the physician to attack localized gonorrhœal foci under guidance of the eye.

Echinococcus of the Thyroid Gland. (*Archiv für klinische Chirurgie*, 1895, xliv., No. 4.)—Henle details a case of echinococcus of the thyroid gland of nine years' growth occurring in a young woman, eighteen years of age, upon which he operated, supposing it to be an ordinary cyst. The wound healed well, but left a complete paralysis of the right vocal cord.

The larger number of these cysts have been found in young people. The author considers diagnosis impossible unless puncture be made. The best method of treatment is incision, removal of membranes and other portions of the parasite, and secondary or even immediate suture.—*American Medico-Surgical Bulletin*.

Statistical Report of Seven Hundred and Three Major Amputations, from the Records of Eight Hospitals of New York City. (*Annals of Surgery*, September, 1895.) By John F. Erdmann, M.D.

These statistics include all cases of single amputations recorded in eight of the largest hospitals in New York during a period of ten years, from January, 1884, to January, 1894. A mortality-rate of 15.5 per centum is shown. The author compares this rate with the mortality found in amputation cases previously collected, and concludes:

That the mortality of single operators is lower than in general hospitals.

That, owing to ignorance of the classes that inhabit our large charity institutions, consent is not easily obtained, in a great number of cases, until

an almost fatal condition is present, and as a result of this condition the mortality-rate is materially increased.

That the mortality-rate in the last few years, owing to improved anti-septic and aseptic technique, has been lowered considerably.

That deaths from secondary hemorrhage have diminished in direct proportion to the perfection of our antisepsis and asepsis.

That age, although a factor in the mortality-rate, does not carry with it at present the great importance of former years.

And, finally, that the prognosis as to recovery from the operation in amputations for disease is much better than in cases of trauma.

The Paraplegia of Pott's Disease treated by Lateral Drainage. (*Rev. d'Orthopedie*, March, 1895.) By Dr. V. Méuard, of Bank-sur-Mer.

The difference in the effect upon the paraplegia in two cases in which this author performed laminectomies, the one in which a tuberculous abscess was opened and drained recovering rapidly and completely, while the other remained unaffected, led this author to draw the conclusion that possibly the difference was due to the opening of the abscess, and that the pressure of the abscess was the cause of the paraplegia, and its drainage would cure this distressing symptom. The theory based upon this reasoning was confirmed by two operations: the first one was in one of the above cases of laminectomy, where the abscess was found and opened, and the paraplegia cured; and the other, in a case upon which no former operation had been performed, and in which there was only opening and drainage. In both cases the paraplegia began to disappear immediately after the opening of the abscess cavity. In further support of the theory and establishment of the utility and efficacy of this operation, the author reports three cases recently operated upon, in detail, in which the paraplegia had existed for a long time before the operation. The immediate result in these cases was, that a few hours after the opening and drainage of these abscesses the patients felt a relief from oppressive feelings and a return of sensation in the lower extremities. The power of voluntary motion began upon the first day and gradually increased, until, at the end of the tenth, fifteenth, and twenty-fifth days respectively, they could stand, and walking became possible. The retardation of sensation disappeared rapidly; the exaggerated reflexes and contractures decreased little by little. The paraplegia in these three cases had existed six, three and one-half, and three years, before the operation. The recovery was, however, as rapid as in the other more recent cases. The author in his operation attacks the osseous seat of the disease and origin of the abscess in the following manner: an incision, two or three inches in length, is made over the most prominent part of the spinal curvature on the side where the greatest area of dulness has been detected. The transverse process on that side is then bared of its periosteum and removed subperiosteally, first from its costal attachment and then torn away as a whole or in fragments from its attachment to the vertebra. The grooved director is then

pushed beneath the periosteum along the lateral aspect of the vertebra until the necrosed bone is touched and the abscess discovered. Pus generally shows itself as soon as the transverse process is removed; it is then only necessary to enlarge the opening. The persistent and immediate improvement in the paraplegia in all cases, and its absence after ten, eleven, and fourteen months in three cases, are markedly successful results.

Large Urethral Defects and their Treatment by Urethroplasty.
(*Wien. Klin. Wochen.*, May 16, 1895.) By Professor V. Dittle, of Vienna.

The author has made a careful study of those cases in which a traumatism arising from a blow upon the symphysis or ascending rami and symphysis of the pubes has produced a solution in the continuity of the urethra without producing a fracture of the bones. For the lesser defects, he advises the passage of an English gum catheter through the urethra into the bladder from the proximal end of the urethra at the point of rupture, and this to be followed by the introduction of the other end of the catheter into the distal portion of the urethra, the fistula being allowed to close by granulation. This method, however, when applied to fistulæ in which there has been a greater loss of urethral tissues, does not succeed, and there remains a cicatrix, and within it a fistula. Simple fastening of the edges of the wound and closure by sutures is hardly ever successful. For larger fistulæ, in which the urethral defect has an extent of over three-quarters of an inch, he advises the following operation, which he performed successfully in a case where there was a defect of over one and one-quarter inches in the bulbous portion of the urethra, there remaining of it only the upper portion and a small part of the sides. An incision was made one-quarter of an inch from the edge of the wound, which was granulated, elliptical in form, having a diameter in its widest part of more than an inch; this incision passed down through the sound skin on the left side, parallel to the granulating surface of the wound, and formed a flap attached at its base along the mucous edge of the fistula, and capable, when laid over on the right side, of covering that side, and bringing the old granulating surfaces in contact. These surfaces were then freshened, and to hold them in apposition till they had united, three silver sutures were passed through the base of the flap, emerging just above the mucous membrane of the fistula on the left side, and entering the right side just above the mucous surface, emerging on the skin of the right side one-quarter of an inch from the margin. When united they formed a deep suture, which included the flap and held the two freshened granulating surfaces in contact; a few joints of silk suture between the silver sutures united the skin. The wound was dressed with a sterile iodoform gauze dressing, the wound made in forming the flap being allowed to heal over by granulation. A catheter was allowed to remain in position after the operation. The process of healing was benign and without fever; the stitches were removed on the twenty-fourth day. There then persisted two minute sinuses at the extremities of the wound,

which healed in eight days. There followed, however, as a complication, an acute suppurative prostatitis, which easily yielded to treatment, the patient making a complete recovery and being able to retain the urine from two to two and one-half hours, and then making a good stream. The author advises the use, at intervals, for some time, of sounds, to overcome the well-known tendency of scar-tissue to contract. A second case yielded equally successful results, and was without fistulæ; there were two flaps formed in this case, one from either side.

Osteotomy of the Tibia for Extensive Osteomyelitis, followed by Compensatory Hypertrophy of the Fibula. (*Revue d'Orthopédie*, March, 1895.) By Dr. Gérard Marchant, of Paris.

In many cases of osteomyelitis of the tibia the bone does not renew itself, and is not strong enough to maintain the weight of the body without the assistance of mechanical appliances.

In the case reported, the tibia did not fill up, but the inconvenience was compensated for by the excessive hypertrophy of the fibula. The patient came under the care of the author, suffering from osteomyelitis in a number of localities, in the most aggravated form in the tibia, where it involved the knee-joint and necessitated the use of osteotomy, extending from the tuberosity of the tibia to about two inches above the lower extremity of that bone. The patient was seen six years after the operation. The leg had a decided curve backward and outward, and was markedly shortened. The knee was very prominent, and examination showed this to be due to the head of the hypertrophied fibula, whose styloid process was on a level with the superior border of the patella, and whose head projected backward and outward, where it had been forced by the development of the tibia and by sustaining the weight of the body. The tibia was flattened and nearly wanting in its middle third, but was normal in the lower third; the foot was in its normal relation. The entire limb was markedly shortened. The fibula was markedly thickened, especially antero-posteriorly. Walking was easy, and the knee-joint could be bent to a right angle.

NEUROLOGY.

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Craniometry and Cephalometry in Relation to Idiocy and Imbecility. (*American Journal of Insanity*, July, 1895.) By Frederick Peterson, M.D.

In a well-illustrated article on this subject the author shows that the circumference of the skull averages fifty-two centimetres in men, and two

centimetres less in women, with a physiological variation from 48.5 to 57.4. The scalp and hair superadd about three centimetres; hence, in cephalometry about six per cent. should be deducted to obtain the measure of the skull. A rough empirical estimate is that where the circumference of the skull is fifty centimetres its volume will be about thirteen hundred and fifty cubic centimetres.

Excessive prognathism is found in criminals, in microcephali, and in cases of hemi- and paraplegia spastica infantilis.

A skull below the normal type in volume belongs to an abnormal individual.

Under typical measurements of the head should always lead us to entertain the suspicion of defective cerebration.

Abnormal smallness of any part of the skull permits the conclusion that the part of the brain in its neighborhood is imperfectly developed.

Excessive development of the head has a double signification. It is always pathological, but may mean abnormality or successful compensation. Wormian bones are also doubly significant. They either represent a pathological process or a successful effort of nature in repair.

Hemiplegia spastica infantilis, epilepsy, and intellectual or ethic weakness often exhibit unilateral aplasia of the skull.

Dr. Peterson gives a condensed table of the thirteen principal measurements for average males and females with physiological variations, and the results of the examinations of nineteen paralytic imbeciles. The greatest transverse diameter was found to be below the normal average in the eleven men, and in all but one of the women examined. The binauricular diameter was lower than the average in all the cases.

The Primary Lesion of Tabes. (*Bulletin of the Anatomical Society*, 1894.) By Dr. J. Nageotte, chief of the laboratory of Professor Raymond, at the Salpêtrière, Paris.

The author speaks of the widely-accepted view of tabes as a degeneration of the posterior roots, with the consequent changes in the columns of Goll and Burdach. The cause of this change has failed to be recognized. Anatomically the close connection of tabes with syphilis has not been noticed as it has been clinically. The explanation of a special action of the poison on the axis cylinder is only eluding the difficulty. Clinically and pathologically there is a close connection between tabes and general paralysis, but the morbid process of the two is very different: the first is confined to certain systems in the cord; the second is diffuse and vascular.

Professor Raymond has recently shown that the primary lesion of general paralysis is constituted by an accumulation of embryonic cells of a connective-tissue origin in the course of the brain capillaries; often this is of a purely inflammatory type, occasionally it is shown to be syphilitic.

Dr. Nageotte has attempted to find a similar lesion in the cord of tabes. The theory of Obersteiner and Redlich, which ascribes the trouble to a

meningitis at the point of entrance of the posterior roots into the cord, finds no acceptance with him. He has studied four cases,—one of pure general paralysis, two of recent tabes with general paralysis, and one of pure tabes. In the case of pure general paralysis there had been no tabetic symptoms, nor was anything noticed in the lumbar cord, yet in the sacral roots initial lesions were found, and in the dural cord a slight band of sclerosis near the posterior horns of both sides. In the three clearly-marked cases of tabes perineuritis and mesoneuritis existed, exactly limited to the space between the ganglion and the entrance of the roots into the arachnoid cavity. These consisted at an early stage in an embryonic infiltration, which later developed into sclerosis.

The location is, according to Dr. Nageotte, of great importance. The anterior and posterior roots join shortly before leaving the dural sac; the arachnoid here forms a common sheath, which is at first loose, farther on closely applied; the united nerve-bundle then enters a diverticulum of the dura, which soon becomes firmly united to the arachnoid sheath; still farther the posterior root enters the spinal ganglion. It is this region of ten to fifteen millimetres in the sacral portion of the cord in which the primary lesion of tabes is found. Here the two roots constitute one nerve, surrounded by a lymphatic space and with a sheath, and here a transverse neuritis, either by compression or by irritation, or by both, leads to degeneration of the sensory fibres.

In transverse cuts at this region a proliferation of round cells exists about the nerve-bundles, with an external band of sclerosis; at other portions this round-cell infiltration is found between the elementary fibres, and later in the process becomes sclerotic; even empty spaces are found here. In this manner the individual nerve-fibres are strangled. The fibrous envelope of the united roots is thickened and contains embryonic cell-masses. The arteries of this region are sound, but the veins show this same infiltration, and offer a striking analogy with the syphilitic meningitis.

The anterior roots are always less invaded, and without appreciable degeneration.

Above and below the small area described all these alterations cease.

In the case of tabes of long duration these lesions mentioned have attained a marked degree of development, and the sclerosis has the chief place.

The absence of this infiltration at other points of the same posterior roots, where these roots are equally degenerated, and the existence of it in the case of general paralysis, where the parenchyma of the roots was sound, are proofs of its primary nature.

In cases of tabes such as the one described by Raymond, where the posterior roots were comparatively sound, attention is called to the fact that a nerve-fibre always degenerates at first at its periphery, which in tabes is in the posterior column of the cord. The lesions in the spinal ganglion are secondary, similar to the destruction of the cells of origin after section of motor nerves.

It is probable that the anterior roots are much more resistant than the posterior, but the infiltration of minor grade can be used to explain the existence of a motor neuritis.

The process is of connective-tissue origin, is probably infectious, and of the same nature as the lesions of general paralysis. The syphilitic origin cannot be demonstrated, but the whole process, especially the presence of periphlebitic nodules, is a strong argument in favor of syphilis. The singular location cannot be explained.

Successful Suture of the Musculo-Spiral Nerve Three Months after its Complete Division. (*Therapeutic Gazette*, July, 1895.) By Wharton Sinkler, M.D.

The patient, a man aged twenty-six, was stabbed three inches above the elbow, dividing the musculo-spiral nerve. There was complete wrist-drop. Tactile sensation was preserved over the entire hand with the exception of an area on the posterior and inner aspect of the thumb extending from the carpo-metacarpal articulation to the last phalangeal joint. Reaction of degeneration marked. Dr. Keen operated three months after the accident. The bulbous portion of the nerve at the seat of injury was excised, and the extremities were stretched and sutured. After five months of persistent treatment by galvanism signs of improvement were noted and function was gradually restored. The history of this case shows how much perseverance with galvanism can do to effect a cure.

The Alterations of the Mental Reading in those afflicted with Cortical Motor Aphasia. (*Society of Biology*, July 6, 1895.) By Déjérine and Mirallié.

In the cortical motor aphasia the agraphia is due to the alteration of the conception of the word; the same is true of the disturbance in the mental reading in lesions limited to the convolution of Broca, as indicated by Trousseau.

To avoid any deception on the part of the patient the following tests may be employed to reveal the mental alexia:

1. A written or printed word is presented, and the patient required to designate the object indicated.
2. After the perusal of an article the patient is called upon to describe what he has read by gestures and such words as he may have at his disposal.
3. The patient is requested to give a response to a written question.
4. After speaking some word in a loud voice the patient is told to find this word on a printed or written page.
5. A false sense is given to a word shown to the patient, who is then asked if the correct sense has been given.

In all the eighteen cases examined there was more or less disturbance in the mental reading. The degree of alexia varied with the patients; some

recognized isolated words, but not phrases; others did not even recognize the separated letters. In proportion to amelioration of the motor aphasia the comprehension of printing and writing returns, and, as a rule, the ability to read is restored before spontaneous speech.

In the cases mentioned the alexia has lasted from a few months to six years.

There is no relation between the degree of motor aphasia and the alexia; a mild and temporary motor aphasia involves alexia, just as a permanent motor aphasia does; on the contrary, the cortical motor aphasia has no connection with word-deafness. MM. Déjérine and Mirallié deny the existence of independent centres corresponding each to one of the parts of speech. There is a speech area, occupying the foot of the third frontal convolution, the angular gyrus, and the first temporal convolution. In this area secondary centres exist,—centres for the motor image of articulation, for the visual and the auditory images, and these are united by fibres of association. All lesions of any point whatever of this zone involve in the internal division of speech an alteration of the idea of the word, and according as one or the other of these centres is destroyed one of the special forms of aphasia will be produced, but with disturbance also in the function of the other centres of speech. The earlier a centre has developed the more resistant it is; such is the case for the auditory centre of words, which is never impaired in its functions as a result of a lesion in the convolution of Broca, whereas this latter is always functionally involved when the auditory centre is destroyed. Writing is the last form of speech acquired by education, and is only a copying of the optic image of letters; it is, therefore, altered in all forms of cortical aphasia.

Thomas and J. C. Roux described their examination of seventeen cases of cortical motor aphasia, taken from the fifty or so patients in the service of Professor Déjérine, afflicted with loss of speech from cerebral trouble. All could read mentally, and the reading appeared only at first sight fully normal. When the separate letters of a word were given to one of these patients she was unable to reconstruct the word. With the exception of two persons, who had recovered, all were unable to read every word. Only four, in whom the speech was entirely restored, were able to write.

Thomas and Roux concluded that the ability to read returns in the following order: First, the design of the word is recovered, then the association of the syllables which form the word, then the letters which form the syllables. The order is, therefore, inverse to that followed by a child in learning to read.

W. G. S.

The Action of Infectious Diseases upon the Spinal Cord. (*Centralblatt für Bakteriologie und Parasitenkunde*, October 5, 1895.) By Grasset and Vaillard.

A certain relation exists between the infectious diseases and diseases of the spinal cord, which can be discovered only through an autopsy. All of

the infectious diseases can, in their various stages, produce some disease of the spinal cord. The clinical picture varies within certain limits with the kind of infection. The micro-organism or its toxin many times causes a secondary infection of the spinal cord, occurring in the course of the infectious disease. A neuropathic predisposition tends to cause spinal-cord infection. The effect of the bacteria or their toxins on the spinal cord is analogous to that of various vegetable and mineral poisons. Some infectious diseases act only on the nervous system.

Crocq produced diphtheritic myelitis in rabbits with cultures of the Klebs-Loeffler bacillus or the filtrate. Henriquez and Hallion caused, by the action of the diphtheria toxins on apes, a disease which bore the clinical picture of acute anterior poliomyelitis. Ballet and Lebon, Ausset, Mayet, and Mosse found that various kinds of spinal affections could be produced in animals by the staphylococcus and streptococcus. Bouchard reports a case in which the pyocyaneus caused a hemorrhage into the spinal cord. Sabrizes and Mongour obtained a streptococcus from a case of icterus catarrhalis levis which caused atrophic paralysis of the extremities in animals. Roger relates a case of poliomyelitis due to the toxin of the streptococcus with atrophy of the ganglion-cells of the anterior horns. Cassaet reports a case of myelitis following beri-beri. Mosse, Weill, and Regaud report cases of affections of the spinal cord and peripheral neuritis with the grippe. Marinisco demonstrated, by a section of a spinal cord in a case of small-pox, streptococci in the central canal, abscess of the cord and its roots, meningo-myelitis tuberculosa. Vincent found thrombi in twenty-eight out of three hundred and forty cases of typhoid fever, which on section revealed the staphylococcus pyogenes aureus and albus. These organisms were also found in the blood during the period of fever.

On so-called "Congenital Chorea." (*American Journal of the Medical Sciences*, October, 1895.) By George F. Johnston, M.D. (Edin.), M.R.C.P. (Lond.), of London.

The disease to which the term chorea has come to be almost entirely confined—viz., chorea minor or Sydenham's chorea—is essentially a disease of childhood, the vast majority of cases occurring between the ages of five and fifteen. But common though it be in childhood, it is very rare, indeed, in early infancy, very few cases having been recorded under four years of age. From time to time, however, accounts appear in the medical journals of instances of "congenital chorea." A case occurring in the practice of the author aroused his interest in the whole subject of congenital chorea, and raised the question whether cases really do occur which can fairly be classed as examples of this condition or whether all recorded cases are not rather to be regarded as the result of irritative lesions of the cortical motor areas in the brain, and not as due to a merely functional instability of those centres such as presumably exists in true chorea minor. In all cases except one the disease has been of an essentially chronic nature,

lasting for years or persisting through life, and this seems sufficient reason for separating the disease from Sydenham's chorea, the duration of which is usually to be measured by weeks, and when apparently indefinitely prolonged there are marked variations in the violence of the choreic movements which would suggest a series of relapses. In the cases of so-called congenital chorea, on the other hand, the movements either remain apparently unaffected by the lapse of time or there is a gradual improvement up to a certain point, though complete cessation of the movements has not been recorded, and in a few cases the disease has seemed to be progressive. The case occurring in the author's practice had been choreic from birth and presented movements such as are met with in ordinary chorea. When presented as a case of congenital chorea before a medical society, the movements changed and presented the typical picture of athetosis. A lesson to be drawn from this case is that there are no hard-and-fast lines to be drawn between the movements of congenital chorea and athetosis. We are justified in concluding that there are strong reasons for believing that all the cases of congenital chorea have really been cases of double athetosis in its choreic form. An attentive examination of the abstracts of recorded cases will show that the existence of true congenital chorea is extremely doubtful, and that all the cases thus far reported, with probably one exception, are examples of double athetosis due either to developmental defect or to meningeal hemorrhage injuring and irritating the motor cortex.

OPHTHALMOLOGY.

IN CHARGE OF CHARLES A. OLIVER, A.M., M.D.,
Philadelphia, Pennsylvania,

AND

EDMUND LANDOLT, M.D.,
Paris, France.

Cataract Operations between the Ages of Eighty and Ninety, with a Table of Cases. (*Boston Medical and Surgical Journal*, September 26, 1895.)

In a brief but valuable paper upon this subject, Hasket Derby, of Boston, Massachusetts, says, "This being a fairly common affection of latest life, and the only method of treatment as yet known to science being operative removal, the extent to which age should influence our prognosis becomes a very practical question." He properly tells us that it would be difficult for one unfamiliar with the subject to realize how much both patient and family physician are apt to be misled by the feeling that the operation for cataract is not worth undertaking after a certain age. He says that, while the chances of success are popularly underestimated, the effect of the operation and confinement on the patient's general health are apt to be unduly exag-

gerated, and many an individual has spent his closing years in blindness which might have been greatly alleviated, if not entirely removed.

In his experience, patients of eighty and upwards form a very inconsiderable proportion of the cases of cataract that come within the experience of the average ophthalmic surgeon in New England. He has found that, according to his estimate, they amount to about six per cent. of the whole number. He remarks, however, that it would seem that six per cent. of total failure, large as it would be between the ages of sixty and seventy-five, as contrasted with eighty-five per cent. of success, does not form a valid reason for denying the operation to those advanced in years. He believes that the use of cocaine renders ether unnecessary, and says that the senile eye is, moreover, much less sensitive than in youth or even middle age. Under ordinary circumstances he has found that the confinement lasts but a fortnight, the patient remaining in bed only the first day. In conclusion, he justly asks whether, with a prospect of the recovery of sight as good as these figures show, it is right to allow a fellow-being to pass the last years of life in blindness, deterred from the operation by an unreasonable dread of the effect of extreme age on the result?

On Erythropsia. (*Ophthalmic Review*, August, 1895.) Based upon personal observation and studies among patients and friends, Fuchs, of Vienna, says, "According to our experiments, therefore, we may state that the erythropsia of normal eyes, as well as of eyes deprived of their lenses, is caused by dazzling, which need not be disagreeably strong, but must be of long duration. Exposure to sunlight reflected by snow is the most effective means of producing it; for most normal eyes it is, moreover, necessary that the dazzling shall take place at a certain height above the level of the sea. The sunlight is there stronger and also richer in short-waved rays. The production of erythropsia is facilitated by dilatation of the pupil, and still more by absence of the lens.

"I believe that the latter protects the retina from dazzling by rendering the light passing through it poorer in short-waved rays. Helmholtz has stated that these are absorbed by the lens in a higher degree than the other rays. Still more is this the case when the lens grows yellow by age. Finally the lens transforms, by its strong fluorescence, short-waved rays into those of greater length. That the erythropsia has its origin in the retina is proved by the fact that, if only one eye be exposed to the dazzling, the erythropsia limits itself to this eye, and that it may be even unequal in the different parts of the field according to the different degree of dazzling."

He explains the condition by the supposition that the retinal purple becomes visible. This, he says, is usually not perceived, because it is always present in the retina, just as we cease to see red if a red glass is worn before the eyes for a long time. By long exposure to strong light, however, the retinal purple is bleached and the retina becomes uncolored. If we now

pass into a dark room, the purple begins to regenerate and become visible. The modern view is that the cones are the organs perceiving the colors. The cones contain no purple, but they are surrounded by purple-colored rods, and the prolongations of the pigmented epithelial cells protruding between the cones and rods contain purple. In this way the cones may be illuminated by purple-colored light from the sides.

Pleading for the retinal purple theory he mentions the following facts :

(*a*) The erythropsia is not produced by short dazzling, even if the dazzling be strong enough to be painful, but only by prolonged exposure to light, such as would bleach the retinal purple.

(*β*) The color of the erythropsia is exactly like the color of the retinal purple.

(*γ*) The erythropsia is as a rule less pronounced or entirely absent in the part of the field of vision which corresponds to the macula lutea.

(*δ*) The erythropsia is also perceived if, after exposure to light, the eye is bandaged for five or ten minutes and then reopened.

Practical Points gained in the Treatment of One Thousand Cases of Insufficiencies of the Ocular Muscles. (*Journal of the American Medical Association*, November 9, 1895.)

In a timely and intensely practical article upon this subject, J. Walter Park, of Harrisburg, Pa., gives the following summary of his own views upon such cases in the following words :

1. That following up one's cases for one to two years is necessary, and should be done in all muscular insufficiencies, to tabulate results for publication.

2. Those cases involving the recti muscles, occurring in hyperopia and compound hyperopic astigmatism of from 5° to 15° , combined with errors of refraction, will generally all do well with their refractive errors corrected, muscular exercises, out-door life, tonic treatment, and the temporary use of prisms.

3. Those occurring in myopia and compound myopic astigmatism require the use of prisms more constantly, and are not benefited quite as much by muscle-exercising as those occurring in hyperopia, etc. Tenotomies with advancements are generally more effective than in hyperopic cases.

4. Those occurring in constitutional, paralytic, and reflex cases require plenty of rest, out-door exercising, the temporary use of prisms, electricity, and general tonic treatment.

5. Tenotomies are not necessary in most cases, and should not be done until all other remedies fail.

6. There are some cases of esophoria of slight degrees of deviation that require nothing but rest and out-door exercise to effect a cure.

OBSTETRICS AND GYNÆCOLOGY.

IN CHARGE OF RICHARD C. NORRIS, M.D.,

Lecturer on Clinical and Operative Obstetrics in the University of Pennsylvania; Obstetrician-in-Charge, Preston Retreat; Visiting Obstetrician, Philadelphia Hospital; Gynæcologist, Methodist Episcopal Hospital; Consulting Obstetrician and Attending Gynæcologist, South-eastern Dispensary and Hospital for Women and Children.

Contracted Bladder treated by Graduated Fluid Dilatation.
(*British Gynæcological Journal*, August, 1895.) By Mayo Robson, F.R.C.S.

In a patient presenting symptoms of vesical calculus a sound was passed in order to determine the size of the bladder. As soon as the sound entered the bladder it impinged against hard calcareous material, and bimanual examination revealed the fact that there was practically no bladder, that organ being merely represented by a small hard lump about the size of a walnut. The urethra was dilated and phosphatic concretions lining the minute cavity were scraped away. The bladder was then found to hold only one-half ounce of fluid. There was incontinence of urine both before and after the operation. The bladder was irrigated with boric acid solution daily, and on each occasion the urethra was compressed around the nozzle of the syringe and moderate force was used to increase the capacity of the organ. In a few days incontinence ceased. Later, ether was given and the bladder was distended with boric acid solution, and it was found that the capacity had increased to two ounces. A later dilatation without ether started up some vesical irritability; but, in spite of this fact, improvement continued, and the patient was discharged with a bladder able to hold eight ounces of urine, which was normal. In this case, as in all cases in which there is no contra-indication, salol and boric acid, each five grains, were given three times daily. The use of these drugs has done much to abolish post-operative urinary fever.

Suspensio Uteri. (*Annals of Gynæcology and Pædiatry*, August, 1895.)
By Howard A. Kelley, M.D., of Baltimore.

The indications for suspension are a retroflexion which cannot be corrected, and whose symptoms cannot be relieved by non-operative treatment, and another class of cases in which, although the uterus may be sharply retroflexed, the chief complaints are often referred to other organs and the patient is neurasthenic or hysterical.

After making the incision in the median line the uterus is brought forward against the anterior abdominal wall. One side of the incision is then lifted with two fingers, and the peritoneum and subperitoneal fascia are caught up with a curved needle carrying the suspensory ligature, passing into the tissue to about a depth of two millimetres, and catching up in the bite a length of about two centimetres. The same ligature is then carried through a part of the uterus on its *posterior* face below the fundus, and,

finally, through the peritoneum and subperitoneal fascia of the opposite side. The ligature is drawn tight and tied, bringing the uterus tightly against the anterior wall. A second suture is introduced, and a third if necessary, passing each suture a little above the previous one.

In one hundred and seventy-one cases operated on no death has occurred, and in only one case has the uterus returned to its old position. Six of the patients became pregnant after the operation, and in no one of them was there any extra discomfort during the time, and the uterus remained in ante-position after childbirth.

Fœtal Hiccough. (*Chicago Medical Recorder*, August, 1895.) By Joseph B. DeLee, M.D., of Chicago.

Singultus has been observed in the child in utero for many years. The author has recently seen two cases. He thinks that no pathological significance can be attached to the phenomenon. It has been observed as early as the seventh month and up to and during labor. Active movements on the part of the mother may cause an attack, and likewise prolonged and rough palpation; but the attacks may also occur during the woman's sleep.

Hink observed an attack of hiccough in a deeply asphyxiated child, unattended by the usual sound, and after removing some mucus from the trachea the child had another attack, attended by the usual characteristic noise. He concludes from this case that there is a kind of singultus without the passage of air through the glottis, and that, therefore, this phenomenon can occur in utero.

This movement can be distinguished from others by its position over the back and shoulders of the child; by its frequency, about every four seconds, which excludes fœtal or maternal pulse; and by the suddenness of the motion, its jerky character, and short sound, which distinguish it from partial contraction of the uterine or abdominal muscle.

Dermoid Cysts and Pregnancy. (*American Journal of Obstetrics and Diseases of Women and Children*, vol. xxxii., No. 2, 1895.) By Barton Cooke Hirst, M.D., of Philadelphia.

This rare complication of pregnancy shows in the case reported how closely a pelvic tumor with intra-uterine pregnancy may simulate in its clinical aspects an extra-uterine gestation.

The patient had, for eight months subsequent to a miscarriage at two months, slight pain and soreness in the left groin from time to time. The menses did not appear when due, about March 22. About a week later she went on a journey and took a severe cold. Coughing produced sharp pain in the left groin, and severe attacks followed, especially after defecation or urination, later small quantities of dark blood were discharged. On examination a cystic tumor filled Douglas's pouch on the left side, pushing the uterus against the symphysis. An operation showed a dermoid cyst on

the left side, the size of a cocoanut, with two large bunches of hair in it. One twist of the pedicle. Intra-uterine pregnancy. An afebrile convalescence followed, and the pregnancy was uninterrupted.

PATHOLOGY.

IN CHARGE OF ALLEN J. SMITH, A.M., M.D.,

Professor of Pathology in the Medical Department of the University of Texas, Galveston, Texas,

AND

HENRY W. CATTELL, A.M., M.D.,

Demonstrator of Morbid Anatomy in the University of Pennsylvania; Prosecutor to the American Anthropometric Society; and Pathologist to the Presbyterian Hospital, the Institution for Feeble-Minded Children at Elwyn, etc.

Tubercle Bacilli in Milk. (*Hygienische Rundschau*, October 1, 1895.)
By Kuno Obermüller, M.D.

This author has made two sets of experiments on animals with the object of finding whether the mixed milk, as found in the markets, contains tubercle bacilli. In the first set sixty animals were used, forty being inoculated in the peritoneum with two to two and a half cubic centimetres each, and the remaining twenty being used as control animals and inoculated with sterilized milk. Young, healthy guinea-pigs of about three hundred and fifty grammes weight were used. Of the forty, three died of a high grade of tuberculosis and eight died within eight or ten hours after injection. From the organs of the latter a pathogenic bacterium was isolated.

The second series of experiments was very interesting. By testing centrifugalized milk, the author found that many bacteria were not carried by their specific gravity to the bottom of the vessel, but remained entangled in the layer of cream. In accordance with this evidence he inoculated animals with one to one and a half cubic centimetres of a mixture of cream and sediment. The results were as follows: thirty-eight per cent. of all animals injected were tuberculous, and thirty per cent. were very much emaciated and died of a high grade of tuberculosis. Of nine control animals one died of peritonitis.

Pearlsucht is seldom seen in animals living on the meadows, but in the so-called "zuckervieh"—the stall-fed cattle—a high grade of tuberculosis is often seen. The author thinks that the sterilizing of milk and sanitary measures in regard to butter and milk are only palliative, and that the root of the evil must be attacked by testing with tuberculin and destroying all infected animals.

FORENSIC MEDICINE.

IN CHARGE OF LORENZO D. BULETTE,
Of the Philadelphia Bar.

AN ACTION FOR MALPRACTICE AGAINST A PHYSICIAN A WAIVER OF THE BENEFITS OF THE STATUTE PRIVILEGING CONFIDENTIAL COMMUNICATIONS.

THE privilege conferred by the statutes freeing from disclosure the information imparted by a patient to his physician, necessary for his treatment, is for the benefit of the patient only and not the physician. Such privilege may, however, be waived by the patient, either in express terms or impliedly by a course of conduct, which the courts, in construing these statutes of privilege, have declared to amount to a waiver. And it has accordingly been decided that, in bringing an action for malpractice against his physician, the patient forfeits his right to have the secrets of the sick-room preserved inviolate in such judicial proceeding.

In a recent case, which was an action by a patient against his physician to recover damages for malpractice, which consisted in failing to properly treat and set a dislocated hip, the evidence showed that the defendant, on December 19, 189—, the day of the injury, was called in and undertook to treat it; and, after making a slight and insufficient examination, he concluded that the injury was a mere bruise, prescribed some liniments for it, went away, and did not return until specially called, ten days afterwards. At this time the hip was dislocated, the known and well-marked symptoms of a dislocation were present, and the surgeon's attention was called to them, yet he made only a slight examination, and still failed to discover the dislocation. On January 2, however, he did discover the dislocation, and made an unsuccessful attempt to reduce it.

There was also evidence in the case tending to prove that after the appellant had treated the appellee for about two months, it being apparent that his treatment was not proving successful, he recommended that the patient should go to the city of A., where the surgeons were better prepared and equipped to treat such cases; that the defendant went with the plaintiff to that city, and Doctor M. and others, assisted by the defendant, made a careful examination of his condition, and advised him as to the proper course to be pursued. In his defence the defendant offered to prove by himself and Doctor M. what occurred at this examination, and the condition and nature of the patient's injury at this time. To this the plaintiff

objected, on the ground that these were confidential communications, and the evidence was rejected, his counsel seeking to sustain the ruling on this ground, and also on the ground that the evidence offered was as to matters occurring entirely subsequent to the defendant's treatment, of which complaint is made, and disconnected therewith.

There was a verdict for the plaintiff for fifteen hundred dollars; but the Supreme Court reversed a judgment entered therein, and instructed the trial court to sustain the defendant's motion for a new trial.

In a former case¹ the Supreme Court had said, "If a patient makes public in a court of justice the occurrences of the sick-room for the purpose of obtaining a judgment for damages against his physician, he cannot shut out the physician himself nor any other who was present at the time covered by the testimony. When the patient voluntarily publishes the occurrence, he cannot be heard to assert that the confidence which the statute was intended to maintain inviolate continues to exist. By his voluntary act he breaks down the barriers, and the professional duty of secrecy ceases. It would be monstrous if the patient himself might detail all that occurred, and yet compel the physician to remain silent. The principle is the same whether the physician called is a consulting physician or is the defendant. The opening of the matter to investigation removed the obligation of secrecy as to all, not merely as to one. When the obligation to silence is broken it is broken for the defendant as well as for the plaintiff. As to all witnesses of the transaction it is fully opened to investigation, if opened at all, by the party having a right to keep it closed. A patient cannot elect what witnesses shall be heard and what shall not; for if once investigation legitimately begins it continues to the end. A patient may enforce secrecy if he chooses, but where he himself removes the obligation he cannot avail himself of the statute to exclude witnesses to the occurrence."

And Mr. Justice Gavin, after adopting the law as above laid down, went on to say in reference to the consultation with Doctor M., "Nor can it be successfully asserted that the defendant should not go into this particular transaction because it was disconnected with the remainder of his treatment, and because the plaintiff had not gone into it himself. According to the defendant's theory of the case, as supported by some evidence at least, this examination and consultation with Doctor M. were but additional steps in the effort to accomplish what defendant had all the time been seeking, the cure of the plaintiff. It was not permissible for the latter to select out certain portions of the defendant's treatment, or certain visits and examinations, and by detailing them, limit the defendant's evidence to those particular occurrences."

¹ Lane vs. Boicourt, 128 Ind. 420.

BOOK REVIEWS.

STUDENTS' AID IN OPHTHALMOLOGY. By Gertrude A. Walker, A.B., M.D., Clinical Instructor in Diseases of the Eye at the Woman's Medical College of Pennsylvania. Forty illustrations and a colored plate. 8vo, pp. 183. Philadelphia: P. Blakiston, Son & Co., 1895.

This little work, as its title and preface tell us, is intended as a preliminary aid to the study of one of the most important branches of medicine, ophthalmology.

Considered in this manner—the only one that a practical teacher can assume for a just criticism of such a work—the reviewer unhesitatingly recommends it as one of the best and one of the most useful pieces of bookmaking that he has seen. The subject-matter is considered logically and is well handled. There is an utter freedom from technicality and uncertainty. The sentences are crisp and easily understood, and there is nothing that is useless,—so that any reader, who knows how to read, must obtain the information that the author desires to impart. She is to be congratulated, and we hope that she will be rewarded by a large and a speedy sale of this her first endeavor in literary ophthalmology.

C. A. O.

SCIENCE AND ART OF OBSTETRICS. By Theophilus Parvin, M.D., LL.D., Professor of Obstetrics and the Diseases of Women and Children in Jefferson Medical College, Philadelphia. New (third) edition. In one octavo volume of six hundred and seventy-seven pages, with two hundred and sixty-seven engravings and two colored plates. Cloth, \$4.25; leather, \$5.25. Philadelphia: Lea Brothers & Co., 1895.

In this, the third edition of Professor Parvin's excellent work, the author has without doubt attained the object desired,—namely, "to give a faithful reflex of obstetrical science and art at the present hour." The book is by no means bulky, yet complete in every department, and contains all the necessary detail required by the modern practising obstetrician. Throughout, many extracts from the writings of eminent authorities on all subjects are appended, giving the work almost the value of a system and lending additional interest to the subject-matter in consideration.

Part I. treats of the "Physiology of Pregnancy, Labor, and Puerperal State," including full chapters on the anatomy of the pelvis, sexual organs, embryology, management of pregnancy, mechanism and conduct of labor, etc. Part II. deals with the "Pathology of Pregnancy, Labor, and Puerperal State." In this latter part Dr. Parvin has given a most lucid explanation of the obstetrical operations, their indications and results. The chapter on "Forceps" we think especially complete, and many practical suggestions are offered for physicians, both young and old. Great stress is laid on the importance of strict asepsis in obstetrical work, and considerable space is devoted to the various complications following infection, comprising the best part of Part III. of the book. When treatment is indicated, Dr. Parvin is explicit in his directions, the remedies suggested being those which have given the best results in his own practice, and while the experience of other obstetricians is never disregarded, the doctor has, we think, quite properly eliminated that host of prescriptions which are usually inserted, and which prove so unnecessary and confusing to the practitioner.

On the whole, the book deserves our highest praise; we consider it one of the most comprehensive of its class published, and take pleasure in recommending the same to students and to physicians.

R. S. J. M.

A TEXT-BOOK ON NERVOUS DISEASES, BY AMERICAN AUTHORS. Edited by R. X. Dercum, M.D., Clinical Professor of Diseases of the Nervous System in the Jefferson Medical College, Philadelphia. With three hundred and forty-one engravings and seven colored plates. 8vo, pp. 1052. Philadelphia: Lea Brothers & Co., 1895. Cloth, \$6.00; leather, \$7.00.

Dr. Dercum and his associates are to be congratulated upon the exceedingly creditable and satisfactory work they have accomplished in the preparation of "A Text-Book on Nervous Diseases, by American Authors." It is a finished and worthy production both from a patriotic and a clinico-scientific stand-point. It is to be hoped, however, that the apparently limited geographical area productive of American neurologists, as indicated in the conspicuous fact that not a single contributor appears from west of the Alleghanies, may not prove a thorn in the flesh of the many good men pursuing that specialty, and not without reward, in our Western and Middle States. The editor, doubtless, has some excellent reason, and yet it seems to me the term American neurologists is misleading when it fails to include such names as Bremer, of St. Louis; Riggs, of St. Paul; Lyman and Brower, of Chicago, and others who might be mentioned. Beyond this fact there remains little to criticise adversely.

The rather unusual order of presenting the different subjects is explained by the editor, in his preface, as having been arranged with the idea that a thorough knowledge of nervous disease was more easily attained thereby, general diseases being considered first and special diseases, with the facts of associated anatomy and physiology, coming afterwards. That such an arrangement does, in any degree, simplify the general subject seems to the writer exceedingly problematical. Superficially considered, it suggests the cart before the horse.

Chapter I. is devoted to general considerations applicable in diagnosis, with more or less elaborate interpolations of various symptomatic phenomena observed. The widely recognized skill and authority in matters of expert neurological diagnosis, of both Drs. Mitchell and Dercum, who jointly write this article, explains, perhaps, the writer's somewhat disappointed impression after reading it. The general considerations presented are the trite and well-worn data of ordinary neurological teaching: anticipated originality is conspicuous by its absence. This chapter also contains a descriptive presentation of ocular phenomena which are in relation to nervous disease, by Dr. C. A. Oliver, who discusses a very interesting subject instructively and with commendable clearness.

Chapter II., on neurasthenia, by Dercum, is one of the best in the book. The term neurasthenia has been heretofore universally credited to Dr. Beard in its present application; an error, it would appear, since another American, Dr. E. H. Van Deusen, of Kalamazoo, Michigan, used the word as a synonym for nervous exhaustion in a paper published in 1867, two years before Beard's first contribution to the subject. Dercum considers, and we think justly, a vitiated heredity as the first and most important etiological factor. In his description of the psychical disturbances observed in this affection, he approaches dangerously near, if, indeed, he does not cross the border-line of insanity, nor am I sure but that these patients really belong and should be classed as among the medically insane. The author adopts the theory of functional cellular exhaustion, as illustrated in the recent experimental researches of Hage, as the essential pathology of this condition, rather neglecting the more easily sustained doctrine of auto-toxæmia. He regards the prognosis as always uncertain, but usually good. Rest, massage, electricity, hydrotherapy, diet, and environmental influences constitute the important elements in treatment. He has found a positive effect for good from the use of certain of the animal extracts and the nucleins.

The next chapter, upon the somewhat related subject of hysteria, is by James Hendrie Lloyd. The fact that hysteria is a morbid entity is emphatically insisted upon by the author, whose article reflects exhaustively the modern views of neurolo-

gists as to the etiology, symptomatology, and treatment of this affection. Of the pathology he says, "It is among the unsolved problems of the infant science of psychology."

Nervous Affections following Railway and other Injuries is the title of Chapter IV., written by Philip Coombs Knopp, whose extensive and careful studies in this field eminently qualified him for the work, a fact attested by the clearness and judicial fairness with which the subject has been dealt with. E. D. Fisher writes upon various diathetic and toxic affections of the nervous system, including those met with as complications in rheumatism, gout, and uræmia and those dependent upon alcoholism, morphine, cocaine, chloral, lead, arsenic, and mercury. Hardly sufficient relative importance is given to alcohol and morphia, especially to the clinical manifestations of these agents in nervous disease induced thereby. Dr. Fisher's modest disinclination to trespass upon the territory of others has led him to deprive us of much that is of value in his larger experience with these types. Cerebro-spinal meningitis, tetanus, tetany, hydrophobia, and diphtheritic paralysis are included in Chapter VI., contributed by William Osler. The recent epidemic of cerebro-spinal meningitis at Lonaconing, Maryland, afforded much new and valuable material to the author. Hydrophobia as a distinct morbid entity is admitted without qualification, and the method of preventive inoculation based upon Pasteur's teachings and conclusions is advocated. In the article upon diphtheritic paralysis it is with some surprise that I note the author's failure to mention the remarkable and almost specific action of strychnine, in sufficiently large doses, in the paragraph on treatment. Functional tremors, paralysis agitans, and epilepsy are treated by Landon Carter Gray. All these papers are written in the clear and forceful style which has made the author a teacher of such wide popularity. It is, however, in the paper upon epilepsy, a most familiar subject, that Dr. Gray appears most interesting and instructive. States of arrested development, malformations, and abnormalities of development and hydrocephalus are enumerated and graphically described by N. E. Brill in the succeeding chapter, which contains much unique and curious information, not exhaustively presented, but sufficiently full for the demands of such a work. Dr. Dercum, who, by the way, is much more than an ornamental editor, writes the chapter upon general diseases of the brain, including pachy- and lepto-meningitis, diseases of the sinuses, and cerebral abscess.

Chapter XIV., upon the anatomy of the cortex and cerebral localization, is the gem of the entire volume. The writer, Dr. Mills, has succeeded to an eminently brilliant degree, in presenting an intricately complex and difficult subject with a clearness, accuracy, and literary finish which leave no room for other than favorable criticism, except perhaps in the single subject of localization for common sensation. Dr. Dana writes the succeeding chapter, upon cerebral hemorrhage, embolism, and thrombosis. His well-known and widely-read papers upon these subjects, appropriately condensed and profusely illustrated, constitute the material of this paper, which is a sufficient criticism as to its excellence.

Chapter XVII. is upon brain tumors, and here again the editor has shown a fortunate judgment in the selection of Dr. M. Allen Starr. A conspicuously valuable feature of this paper is a table of operative results brought up to date, and the most complete, perhaps, ever published. Chapters XXII., XXIII., and XXIV., upon infantile hemiplegia, parietic dementia, and syphilis of the nervous system, are written by Dercum, whose editorial industry is equalled only by the excellence of his contributions. Chapters XVIII. and XIX., upon general and systemic affections of the spinal cord, are by Lloyd and Morton Prince. Both chapters are headed with an array of subtitles which are rather appalling in number and confusing in their apparent lack of relation, but a study of the text relieves the reader of embarrassment from both sources.

The greater portion of the volume which relates to the systemic and other affec-

tions of the spinal cord has been written by Dr. F. Peterson. In his paper upon the structure and functions of the spinal cord with localization, the subject has been presented clearly and with a just appreciation of the importance of emphasizing its clinical aspect. In the succeeding papers upon locomotor ataxia, bulbar paralysis, and disseminated sclerosis, the author appears to best advantage in a discussion of the pathology involved and the symptomatology, while the subject of diagnosis, most important, perhaps, to the practitioner, is lacking in fulness and clearness.

Wharton Sinkler writes Chapter XXV., which includes various forms of disease of the peripheral nerves, a very important and, in many respects, a comparatively new field in neurology. Diseases of the cranial nerves are treated in two chapters, XXVI. and XXVII., edited by Drs. De Schweinitz and C. Herter respectively. The latter, in discussing surgical measures for the relief of painful affections of the fifth, is entirely too optimistic in his views as to the dangers from Hortley's and other similar operations for the removal of the Gasserian ganglion, as such dangers are indicated by the tables published in the recent work of Chippault. Dr. Herter also writes the following paper upon diseases of the spinal nerves and their plexuses. The affections of the muscles which are of neural or cerebro-spinal origin are described in Chapter XXIX., by Dr. Jacoby, who also contributes the last chapter, upon neuro-electro-therapeutics, both ably and entertainingly written. Joseph Collins, under the title Tropho-Neuroses, writes of acromegaly, angio-neurotic œdema, scleroderma, and Raynaud's disease, quoting an abundant literature, reflecting the most recent and generally accepted views as regards etiology, pathology, and treatment. A graceful and finished literary art adds much to the charm of this paper. The Tropho-Neurosis associated with Pathological Changes in the Thyroid Gland (hardly a legitimate basis for separate consideration) is the title of Chapter XXXI., by Dr. Burr. Under this title he discusses the phenomena of myxœdema, cretinism, and exophthalmic goitre, bringing these up to date. Dr. J. C. Wilson's large personal experience has served a valuable end in affording him the material for the chapter on symptomatic disorders, including insomnia, vertigo, headache, and migraine. His therapeutic suggestions are marked by a peculiarly happy conservatism and value. Chapter XXXIII. deals with surgical procedures indicated in various cerebral, spinal, and neural affections, especially epilepsy, hydro- and microcephalus, tumors, abscess, and meningitis. No happier selection has been shown throughout the entire book than in assigning this chapter to Professor Keen, whose work in this field marks an epoch in American medicine, and is in fact recognized as authoritative throughout the medical world. His reputation has not suffered any loss in this his latest contribution to neurological surgery.

It would be unjust not to refer with due appreciation to the excellence of the work which the publishers have given to this volume. The print is clear and large; I did not note a single typographical error; the illustrations are up to the highest standard; the binding is both durable and æsthetic, and when it is considered how important the rôle of publisher is, in the attainment of success or failure by a new candidate for favor before the reading medical public, those who will see this book will readily appreciate this tribute to their skill. W. B. PRITCHARD.

A TREATISE ON NERVOUS AND MENTAL DISEASES. By Landon Carter Gray, M.D., Professor of Diseases of the Mind and Nervous System in the New York Poly-clinic. Second Edition. 8vo, pp. 728. One hundred and seventy-two engravings and three colored plates. Philadelphia: Lea Brothers & Co. Cloth, \$4.75; leather, \$5.75.

In the second edition of this work many improvements are noted. The anatomical introduction has been entirely rewritten, so as to accord with the latest researches. Thirty-six papers have also been added to the section on mental diseases. On the other hand, the author has done well to withdraw some of the illus-

trations, notably one denominated "acromegaly," but more evidently myxœdema. In this edition the thyroid treatment of myxœdema is given its proper place, and regarding the preparation of the glands the author states that the alcoholic extract can easily be made from the fresh glands, and that it is not at all necessary to keep the extract any longer than is needful for the making, any more than in the case of any other extract, contrary to what certain interested persons would have us believe. Dr. Gray speaks of the advantages of a warm and equable temperature for such patients, and advocates the regular removal in the winter to Southern climates.

The tenth chapter is devoted to "Nervous Diseases of probably Microbic Origin,"—to wit, tetanus and tetany, hydrophobia or rabies, and diphtheritic paralysis. It strikes us as rather a short list. We did not think that any one had any further doubt as to the microbic origin of tetanus. The tendency is to include several other diseases in this category. The author does not commit himself, however, to a belief even in the infectious nature of anterior poliomyelitis. One cannot read the accounts of the recent extensive epidemic of infantile paralysis at Rutland, Vermont, and other epidemics in France and Sweden without being impressed with the immense probability of its infectious nature, notwithstanding the fact that the microbe has not yet been demonstrated. Men like Grawitz, Dana, Putnam, and Welch have come out boldly in favor of the toxic or microbic origin of a number of these diseases. Our belief is that poliomyelitis, multiple neuritis in certain forms, leprous neuritis, cerebro-spinal meningitis, in cases of which the micrococcus lanceolatus has been observed, are all, either directly or indirectly, of microbic origin.

In his description of multiple neuritis the author notes its toxæmic and infectious nature, and gives an excellent description of kakké, but does not use the term even in the glossary in the appendix. His directions as to treatment are admirable, as, indeed, they are all through the work, and cannot fail to impress one as the fruit of a very wide personal experience. Dr. Gray has observed a very curious fact with regard to the treatment of multiple neuritis to which we have never seen attention called elsewhere. In several of his patients in whom the pain could not be controlled, and in whom the disease was progressing, removal from the locality in which they had been attacked to another place would often effect a marvellous change. If there is an acute malarial history, quinine or Warburg's tincture, should be used in sufficient doses. In alcoholic cases it is recommended that quinine be used gradually in place of alcohol, and should cinchonism result, the conjoined use of bromide of potassium will be of benefit. Later on, massage will be of benefit when gently applied.

Regarding epilepsy, much valuable and interesting information is afforded. Rejecting all notions as to vasomotor changes in the cerebral circulation, the author holds that epileptic manifestations are due to a peculiar molecular condition of the motor tract, which runs from the motor convolutions to the peripheral motor structures and muscles. Of what this condition is we shall probably remain in ignorance, until, in the ripeness of time, we shall possess such instruments of precision as will enable us to see the molecular play in the living brain and spinal cord. Dr. Gray calls no case cured until five years have elapsed without a return of the convulsion, and states that he has never yet seen a case of *petit mal* materially affected by treatment except in those who suffer from malnutrition or where the attacks are due to the formation of ptomaines from an acute indigestion. The first place among remedies is given to the bromides.

Regarding syringomyelia the author has not modified his conservative position very much, saying that "it is now quite a fashion in this country to report so-called cases of syringomyelitis. Very few ante-mortem diagnoses have been made, however, although recently Dercum has reported a brilliant one." As a matter of fact, Sinkler and Lloyd have both made such diagnoses, and verified them at autopsies and published their cases. Schultze, Kahler and Pick, Critzmann, and others have made diagnoses and verified them in a similar manner.

Five new chapters on insanity have been added in the second edition. Dr. Gray believes in home treatment in all curable cases where sufficient means are available. His reasons are that realization of the fact that the patient is in a lunatic asylum is a great blow to the sufferer; that the nurses in such institutions are never so efficient as the trained nurses we can command outside; that the stigma of having been in an asylum is of itself a serious misfortune, and that the stage of convalescence cannot fail to be retarded by the constant contact with lunatics. These are weighty reasons, and coming from an alienist of Dr. Gray's reputation and practical experience must command thoughtful attention. The great question, how our hospitals for the insane can be improved in all these respects, has of late attracted widespread consideration. Existing methods of hospital management have been arraigned. In consequence of all the criticism and friendly suggestion by outside practitioners, there is gradually coming to light a more energetic and scientific management of the insane. The resident medical officers and the boards of managers cannot be oblivious to the points of weakness that have been pointed out by such men as Mitchell and Gray, and it is with great satisfaction that we see in various quarters indications that a brighter day is dawning for the curable insane.

We cannot leave Dr. Gray's book without commending his glossary and enlarged index, and expressing the pleasure which we have had in reading his interesting treatise, the fruit of personal experience. G. H.

ANNUAL OF THE UNIVERSAL MEDICAL SCIENCES. A Yearly Report of the Progress of the General Sanitary Sciences throughout the world. Edited by Charles E. Sajous, M.D., and Seventy Associate Editors, assisted by over two hundred Corresponding Editors, Collaborators, and Correspondents. Illustrated with Chromo-lithographs, Engravings, and Maps. In five volumes. The F. A. Davis Company, Philadelphia, New York, Chicago, 1895.

In looking over this, the eighth issue of the Annual, the reviewer is seized with admiration for the organizing power and executive ability of the editor, who has called to his aid a numerous corps of writers from many countries, whose independent contributions must have needed much supervision to prevent the frequent repetitions that are so apt to occur in a literary undertaking—as minutely subdivided as the Annual is.

Reference books of the type of the Annual have a distinct and indisputable value in our productive age, when literature in every branch of medicine is accumulating with a rapidity that is truly appalling to any one honestly endeavoring to keep abreast with contemporaneous progress. It is a source of considerable comfort to have within reach a compilation, in the form of short abstracts, of the most important contributions to medicine within a given period. The Annual, although it contains some unimportant matter that is scarcely worthy of incorporation, presents a good *résumé* of medical progress, and will be found a useful addition to the physician's library, one to which he will have frequent recourse. D. R.

BOOKS RECEIVED.

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PEDIATRICS; THE HYGIENIC AND MEDICAL TREATMENT OF CHILDREN. By Thomas Morgan Rotch, M.D., Professor of the Diseases of Children, Harvard University. Illustrated.

WILLIAM WOOD & CO., NEW YORK.

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to the Cancer Hospital, New York, etc. Illustrated with forty-one original full-page photographic plates. 8vo. Pp. 261. Cloth, \$2.50.

TRANSACTIONS.

TRANSACTIONS OF THE MICHIGAN STATE MEDICAL SOCIETY FOR THE YEAR 1895.
Vol. xix. Publication committee, Drs. C. W. Hitchcock, J. B. Whinery, A. P. Biddle, A. E. Bulson, and C. H. Johnston.

ITEMS OF INTEREST.

THE colored citizens of Philadelphia have exerted themselves to establish a school in which young colored women can be trained in the important branch of practical medicine, nursing. In order to have material with which to illustrate the principles and practice of nursing, those interested in the establishment of this school have opened a hospital for colored people in connection with the training school. The managers have taken a lease of a three-story house on Lombard Street above Fifteenth, and have knocked out partitions so as to make a ward in the second and a ward in the third story. These wards hold nine beds; that in the second story is to be devoted to the care of women patients, and that in the third story is to be devoted to the care of male patients. In addition to the ward, the second floor contains an operating-room, with a room immediately adjoining which can be used for operation cases or for private patients. This floor also has a toilet-room. On the third floor, besides the ward, are to be found the resident physician's room, the nurses' dormitory, and another toilet. The first floor is devoted to administrative offices and kitchen, and the basement is occupied by rooms for an out-patient department and a laundry. The medical staff is as follows: Consulting Surgeons, John B. Deaver, M.D., and Thomas S. K. Morton, M.D.; Consulting Physicians, James Tyson, M.D., and Roland G. Curtin, M.D.; Consulting Gynæcologists, B. F. Baer, M.D., and Hannah T. Croasdale, M.D.; Attending Surgeons, J. P. Tunis, M.D., N. F. Mossell, M.D., and J. Thomas Stanford, M.D., Assistant; Attending Physicians, E. C. Howard, M.D., and William H. Warrick, M.D.; Attending Gynæcologists, Caroline V. Anderson, M.D., and Theo. A. Erek, M.D., and George R. Hilton, M.D., and D. W. Ogden, M.D., Assistants; Obstetrics and Diseases of Children, James T. Potter, M.D.; Ophthalmologist, H. F. Hansell, M.D.; Pathologist, A. A. Stevens, M.D.; Dermatologist, J. Abbott Cantrell, M.D.; Dental Surgeon, William A. Jackson, D.D.S.; Pharmacist, Henry M. Minton, Ph.G. A resident physician is to be appointed. Ten of these gentlemen are colored men. The

training-school will be in charge of Miss Minnie M. Clemens, a young colored woman, who received her training at the Hospital of the University of Pennsylvania. It is proposed to have three resident nurses, and to run the number in the class up to twelve, the pupil nurses who do not live in the hospital to have rooms in the neighborhood.

At an extraordinary meeting of the College of Physicians of England, held October 24, 1895, the question of the admission of women to the diplomas of the college was the subject of an earnest and interesting discussion. The admission was opposed by Charles West, Sir Joseph Fayrer, Hare, Barnes, Douglas Powell, Sir R. Quain, Sir William Jenner, and the president of the college, Sir J. Russell Reynolds, the last stating that, in his opinion, women were physically, mentally, and morally unfitted for the practice of medicine. The cause of the women was advocated by Sir B. W. Richardson, Sir W. Broadbent, and Dr. Payne. At the end of the discussion a division was taken with the following result: for admission, 50; against, 59; majority, 9. At a similar meeting held eighteen years ago, the request of the women for admission was rejected by 68 votes to 18.

The Close Relations existing between the Physician and the Scientist in Germany.

The causes which have raised German medical science to its present undisputed pre-eminence have been frequently discussed in print, but one factor, it seems, has either been entirely overlooked, or, if mentioned, has not received proper appreciation. We refer to the close and fraternal affiliation of the German physician and the German scientist. The physician meets in annual convention the physicist, the chemist, the zoologist, the botanist, and the mathematician, and is made aware of the discoveries in their branches; he has brought before him the results of patient and thorough scientific method, and is of necessity inspired to follow an example set by the greatest minds of his nation. At the recent congress in Lübeck (*Die 67. Versammlung der deutscher Naturforscher und Aertze*) several brilliant and lofty addresses were delivered at the general meetings, at which physician and scientist met in a spirit of brotherhood.

We have not space to discuss the addresses of the electro-chemist Ostwald, who spoke on "The triumph over scientific materialism," of Victor Meyer, who espoused with powerful arguments the atomic theory, and detailed his pyrothermic experiments on the ultimate constitution of the elements, or of Rindfleisch, who in his lecture on "Neovitalismus," took refuge in the teleagic idea to explain the phenomena of life, or rather life

itself. Unquestionably the effect of hearing such philosophic addresses is to ennoble and to inspire. We would fain see American medicine form an integral part of American science.

Mr. W. M. Woodhouse¹ has recently reported a case of congenital absence of the rectum, the malformation escaping discovery for three days.

Absence of the Rectum. No similar case has occurred in nearly two thousand births in the Kensington Infirmary, and only one case of imperforate anus is there recorded. We recall once making a post-mortem upon a case of absence of the rectum for Dr.

B. C. Hirst, in which the nurse was supposed to have given a glycerin suppository on several occasions, and by this means to have obtained a fæcal passage from the child!

NOTE TO CONTRIBUTORS.

AUTHORS will receive liberal compensation for accepted articles upon publication; or reprints, if stated on the manuscript, will be furnished in lieu of the honorarium. It is distinctly understood that all articles appearing as original matter are for our exclusive use, and are not to be reprinted or to appear in any other publication excepting the Transactions of the society before which the paper may have been read. Illustrated papers are especially desired.

All matters of business, as well as subscriptions, should be sent to the INTERNATIONAL MEDICAL MAGAZINE COMPANY, 716 Filbert Street, Philadelphia.

Manuscripts, exchanges, and books for review should be addressed to the Editorial Office, 3709 Spruce Street, Philadelphia.

¹ Lancet, September 21, 1895.

INTERNATIONAL MEDICAL MAGAZINE.

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JANUARY, 1896.

[No. 12.

ORIGINAL COMMUNICATIONS.

PRIMARY TUBERCULOSIS OF THE KIDNEY, WITH ESPECIAL REFERENCE TO ITS MANIFESTATIONS IN INFANTS AND CHILDREN.

FROM THE PEPPER LABORATORY OF CLINICAL MEDICINE. NO. 3.

BY SAMUEL M. HAMILL, M.D.,

Associate in Clinical Medicine, Pepper Laboratory of Clinical Medicine, Philadelphia.

THE subject of this paper was suggested by the post-mortem findings in the following case :

CASE I.—Katie H., aged seven months, presented a good family history. The child first came under observation on the 2d of October, 1893. There had been no illness prior to this date. Until the age of three months the feeding had been limited to the breast. For a very brief period in this time the child had been suckled by an apparently healthy wet-nurse.

From the age of three months until the above date she had received cow's milk in addition to that from the breast. Two nights previous to the date of presentation the child became feverish, had loose, yellow, offensive stools, containing flakes and mucus; six movements of a like character the following day accompanied by pain, and one movement on the 2d of October without pain. The temperature was normal, the child did not seem ill, but was quite anæmic, a condition which had existed since birth, and one that applied to the only other child in the family. Three days later the child was reported well.

On the 25th of October the child was again seen. Until two days previous she had apparently been perfectly well. She had then become feverish and restless. There had been no vomiting, but diarrhœa with green, foul-smelling stools, containing flakes and mucus. She had taken nourishment well. There had been no convulsions, no cough, and no difficulty in swallowing.

The skin and mucous membranes were very pale. She was restless during sleep, constantly rubbed her head and ears, cried out suddenly; she suffered pain when the

bowels were moved or the urine voided. Micturition was free, not frequent. The temperature was 104.6° F.; pulse, 168, and bounding. There was a slight, glairy, mucous discharge from the vagina. The abdomen was not much distended, rather soft, no tenderness. Examination of the heart and lungs was negative. Two days later the abdomen was more distended and tympanitic, and there seemed some special tenderness in the lower abdominal region, but the child seemed to suffer pain in any movement of the body. The temperature was 104° F.; pulse, 164, and respiration, 30. On the fifth day she developed marked twitchings of the muscles of the forearm and hand, and later the muscles of the legs became involved. The child awakened from sleep suddenly, crying out and continuing to cry ceaselessly for a period of three or four hours. The twitchings were more marked during these paroxysms. Later, quite marked retraction of the head developed, the muscles of the back of the neck were hard, the eyelids were partially closed; at times the eyeballs rolled upward. There was no strabismus or change in the pupils at any time. The child vomited but once during the illness. The temperature throughout fluctuated between 101° F. and 105° F., the pulse-beats between 160 and 170, the respirations, until the tenth day, between 25 and 30; but at this time, simultaneously with the development of a severe, paroxysmal cough and moist râles throughout both lungs, they suddenly advanced to 60, and fluctuated between this and 80 until the end. There were no convulsions.

Autopsy.—Heart and pericardium normal.

The lower lobe of the left lung was the seat of a pneumonia, the right lung was congested. There was one slightly enlarged bronchial gland. The mesenteric glands were generally enlarged, but not at all caseated. All the abdominal organs save the right kidney were normal.

Examination of the brain was forbidden.

The right kidney (Plate I.) is several times the size of the normal kidney. It measures nearly five inches in length, two and three-fourths in breadth, and one and one-half inches in thickness. The surface is irregularly nodulated. There is a quite extensive fibro-adiposis of the adipose capsule, and the same process extends to the external covering of the ureter. The adipose capsule is with difficulty separated from the true kidney capsule, which is also much thickened. It is tightly adherent to the glandular substance in some places. At the topmost point of the convexity, just over a point of beginning softening, it is elevated and detached, and adhering to the surface at this point are portions of degenerated kidney substance. On section, the kidney seems to consist of a mass of various-sized tuberculous nodules. Very little healthy kidney structure is apparent. The cortex seems entirely destroyed. The apices of some of the pyramids have the appearance of being only partially infiltrated. The pelvis is small, being infringed upon by the excessive tuberculous growth. Its mucous membrane is smooth, not apparently thickened; it seems normal. The ureter and bladder are normal.

Sections of the kidney showed scarcely any areas of healthy tissue. The blood-vessels were thickened, and there were large masses and scattered round cells with extensive areas of cheesy degeneration in the most advanced portions. Sections of the thickened capsules showed some areas of cheesy degeneration, apparently extending from the softened adjacent kidney structure. They also showed great increase in the fat and fibrous elements. Sections of the pelvic mucous membrane were negative. Sections were stained for Koch's bacillus, with negative results.

Notwithstanding this last fact, I believe there can be no doubt of the tuberculous character of the condition from the fact of the discovery of such diffuse, exudative, and proliferative changes marked by decided tendency to early and extensive caseation. The thought suggested itself that

PLATE I.



See report of autopsy of Case I.

the case might be one of gumma of the kidney; but, in addition to the absence of any suggestive history, as well as of suspicious lesions of other organs (liver, spleen), there was the more positive disproof of syphilis in the appearance of the kidney itself. The process was evidently too diffuse, and the caseation was altogether unlike the degenerative changes one observes in this or other organs in connection with syphilis.

In addition to this case a prolonged and thorough search of the literature has resulted in the finding of fifty-four cases occurring in children under the fourteenth year. The reports of many of these are very incomplete. Cases XXXI., XXXII., XXXIV., XLIII., and XLV. of the series, for instance, consist only in references to cases which had been observed by the authors. In Cases III., XXX., XL., XLII., and XLV. there must exist some doubt as to the diagnosis, since it is based solely on symptomatic evidence. In many others only the *post-mortem* records are given, and some of these but briefly. All cases have been accepted, and are here presented as cases of primary renal tuberculosis, because they have been so presented elsewhere.

Primary tuberculosis of the kidney is synonymous with the scrofulous degeneration of the old writers. It has been described under various names, such as renal or nephro-phthisis, chronic tuberculosis, cavernous tuberculosis, scrofulous caseating tuberculosis, etc.

The history of tuberculosis of the kidney is brief. The condition was first carefully described by Morgagni and Baillie, and later by G. L. Boyle. Following upon these are the observations of Howship, Rayer, and Ammon, the last of whom says, in reporting a case in 1830, that there had been but a passing reference to primary renal tuberculosis prior to that time. More recently the literature has multiplied. It has dealt largely with the surgical aspect of the question. The pathological anatomy has received especial attention at the hands of Cornil and Babes, Durand-Fardel, Cayla, Vigneron, Charcot and Bouchard, Duret, and others. Very few text-books give the subject more than brief notice. Fagge, in his "Practice of Medicine," and Charcot, Bouchard, and Brissaud, in their recent "Traité de Médecine," have the best text-book descriptions observed in the course of these studies. Gaultier, in his Paris "Thesis," has treated especially the subject of primary tuberculosis, but the condition, as it occurs in children, does not seem to have received much attention.

ETIOLOGY.

The *causes* are chiefly those of tuberculosis in general. Heredity, catarrhal inflammations, lowered vitality, trauma, stone in the kidney, the influence of soil and locality, all pave the way for the reception and development of the bacillus of Koch, which finds its way into the organism through the air, or by means of food and drink. Sex is a predisposing factor. The weight of opinion finds the condition much more common in males than in females. In fifteen cases of all ages reported from the Middlesex Hos-

pital, nine were in males and six in females. Rosenstein, after an analysis of twenty cases, remarks that men are affected more often than women. Ebstein found it twice as common in males as in females. F. J. Roberts makes a like statement, and Osler finds it to be more frequent in males than in females. In the fifty-five cases here presented the sex is mentioned in forty-six; of this number thirty-two are boys and fourteen are girls, suggesting that in the earlier years of life the male sex is more commonly affected than in adult life. In support of this also, in one hundred and three cases collected by Facklam, including all ages, but chiefly adults, thirty occurred in males and seventy-three in females.

Age.—Primary tuberculosis of the kidney is relatively uncommon in childhood, and exceedingly rare in infancy. In ten years, at the Middlesex Hospital, in two thousand six hundred and ten autopsies there were forty-four cases of renal tuberculosis; twenty-nine were of the miliary and fifteen of the primary form. Of these fifteen, seven occurred in persons over thirty years of age; five occurred in persons between eleven and thirty years of age; three occurred in adults whose ages were not given. There was not one instance under eleven years.

Rosenstein thinks it most common in middle and advanced life. In twenty cases, observed by himself, he found in the first ten years of life, one; between the twentieth and thirtieth years, six; between the thirtieth and fortieth years, three; between the fortieth and fiftieth years, six; and between the fiftieth and sixtieth years, four.

Facklam's one hundred and three cases, lately referred to, were cases requiring nephrectomy. Seven per cent. of his cases occurred between birth and the tenth year; 9.4 per cent. between the tenth and twentieth years; 37.6 per cent. between the twentieth and thirtieth years; 37.6 per cent. between the thirtieth and fortieth years; seven per cent. between the fortieth and fiftieth years; and 1.2 per cent. between the fiftieth and sixtieth years.

Henry Morris says scrofulous kidney is at least somewhat exceptional below the tenth year.

F. J. Roberts found it most common in the middle period of life, and says that the earliest age reported, prior to 1879, was three and one-half years.

Dr. J. Walter Carr found in the post-mortem records of one hundred and twenty children dead from tuberculosis in the Victoria Hospital for children, Chelsea, only two cases in which the disease began in the kidneys. This he thought an uncommonly large percentage, as he believed the condition to be rare.

Dr. C. Bohm, of Stettin, writing in 1884 says, "In the new literature I have not been able to find any case of nephro-phthisis in a child. The observations which have been published since 1877 concern adults exclusively."

Aldibert found in a collection of twelve cases occurring in children,

four occurring between two and a half and four years; two between seven and eight years; three between ten and eleven years; and three between twelve and fourteen years. In the fifty-five attached cases there are but two under one year, the one a boy of three months upon whom Bardenheuer did a nephrectomy with fatal result, and the other my own case. These cases, therefore, show that under one year there were two cases; between one and two and a half years, three cases; between two and a half and five years, ten cases; between five and ten years, eleven cases; and between ten and fourteen years, twenty cases. There are nine cases reported in which no age is given.

MODE OF INFECTION.

One observes, in studying the literature, that great diversity of opinion exists as to the starting-point of uro-genital tuberculosis. One class denies the existence of a primary lesion of the kidneys, attributing its development to pre-existing disease in the genital or lower urinary organs. In other words, they establish for it an ascending course. A second class, taking an entirely opposite view, hold that the kidney is always the organ of primary involvement, the lower urinary and genital organs being secondarily involved,—that is, the course is descending. A third class admits the possibility of both the ascending and the descending forms.

Rokitansky, Hirschfeld, Lancereaux, and Klebs hold to the first of these theories, believing the beginning, in the great majority of cases, to be in the epididymis, seminal vesicles, or prostate, and that it is propagated from these to the urinary organs above. Simon, of Hamburg, tries to prove, by statistics, that this is the general mode of infection. In fourteen autopsies he found tuberculosis of the kidneys nine times, of the bladder thirteen times, of the prostate twelve times, of the epididymis twelve times, and of the seminal vesicles thirteen times. Steinthal adheres to the descending course, basing his opinion upon cases which he had observed in Geneva, together with a few cases taken from the literature.

Ziegler adopts the intermediary opinion, which admits the possibility of both the ascending and the descending forms. Camargo, desiring to arrive at some definite conclusion in the matter, made a review of all the cases upon which autopsies had been performed in Geneva in the past fifteen years. He found that in three thousand autopsies the records showed twenty-nine cases of chronic tuberculosis of one or both kidneys. Of these, twenty-five showed tuberculosis of the bladder, eleven showed tuberculosis of the genital organs. In these eleven cases, also, there was tuberculosis of the bladder, and they are included in the above twenty-five. In the twenty-five cases, therefore, of combined tuberculosis of the kidney and bladder there were fourteen in which the genital apparatus was not involved. He adds to this series a case of his own in which the kidney and bladder alone were involved, and in the light of these statistics concluded that in fifteen cases the tuberculosis of the bladder had developed after that of the kid-

ney. He inclines to the belief also that in the eleven other cases the starting-point was in the kidney. He believes it possible, but very exceptionally the case, that the disease is propagated from the genital organs to the bladder, and from thence to the kidney. Guyon and Duret believe the ascending form to be the more common.

Charcot and Bouchard, in their "Traité de Médecine," say, "It is certain, first, that renal tuberculosis may exist alone; second, that it may be developed at the same time as is tuberculosis of the pelvis; third, that the ureter participates frequently at the same time as the pelvis and kidneys. In general, in these three categories of cases tuberculosis has started in the kidneys." Further on they say, "We admit with Rayer that urinary tuberculosis shows, in the great majority of cases, a descending course." While they admit that each or any of the genito-urinary organs may be the starting-point in localized or extending tuberculosis, they believe the kidneys to be most often the seat of the primary focus. Vigneron believes the ascending or, as he calls it, the secondary form, the more common, especially in men. Dickinson adheres to the primary form, and in this view is supported by Bruce-Clark. Israel finds the descending form the more common. Roberts found the ureter affected thirty times in thirty-two kidney cases, and the bladder twenty-one times. Weigert advocates the ascending form, and Hamilton, who quotes him, inclines to the descending. Dr. Leo Szumam believes in a one-sided, local, primary disease, and that any existing bladder condition is nearly always secondary to the kidney trouble. Du Pasquier thinks renal tuberculosis of vascular origin is frequent; but, where lesions of the bladder exist at the same time with infection of the kidney, he considers the disease primary in the bladder in the vast majority of instances. He says also that where one kidney only is affected in the ascending form it is merely a matter of chance, and depends upon the point in which the ulceration originates. Aldibert believes in the greater frequency of the descending form, especially referring to cases observed in children, and he finds tuberculosis of the genital organs relatively rare in children.

Du Pasquier thinks the tuberculous infection ascends to the kidney as frequently by a process of extension along the course of the ureter as by elevation through the medium of the urine. It has been experimentally proven that the tuberculous infection may ascend the ureter, by one or the other process, by the experiment of Albarran. He ligated a ureter in its lower portion, and just above the point of ligation injected into it a pure culture of tubercle bacilli. Two months later the animal died of general tuberculosis, with the lesions of ascending tuberculosis in the first kidney, and those of infectious descending tuberculosis in the other. It would seem, however, that this course is infrequent, since Albarran is the only person who has ever succeeded in producing ascending infection experimentally. Cayla made similar experiments with negative results, and by injecting cultures into the bladder of guinea-pigs failed to produce lesions in

the kidney. In the light of these results he concludes that the ascending form is impossible. Du Pasquier has conducted similar experiments with negative results, but in the light of Albarran's experiment and his own clinical observations, he believes in an ascending infection.

The deductions which I am able to make from the fifty-five cases here presented, as to the probable starting-point of uro-genital tuberculosis in children, are in full accord with those of the authors who hold to the descending form. In the entire series there are scarcely any cases that suggest an ascending extension, and these few can be as justly classified under descending extension.

In one of the cases only, Case XLI., has involvement of the genital organs been noted, and in this case Kulakowski, who reports it, thinks the disease originated in the kidney.

In the fifty-five cases there are eleven without post-mortem or operative records, and eight in which the descriptions are incomplete. In the remaining thirty-six, from which deductions can be made, the kidney is alone affected of the urinary organs eighteen times, the kidney and ureter alone twice, and the kidney, ureter, and bladder together sixteen times. Among these sixteen cases there is but one—Case XXI. of the series—which seems a probable instance of primary involvement of the bladder. Schmid, who reports Case LV., seems to think that there is some question as to whether the condition was or was not primarily one of tuberculous cystitis with secondary involvement of the right kidney. His description of the kidney lesion is not very full, but the early and subsequent history of the case would suggest secondary rather than primary bladder involvement. There are only four of the sixteen bladder cases in which there is any extensive disease of the organ. In the majority the area of involvement is limited to the trigone and the neck of the bladder. In all cases, save Case XXI., already referred to, the tuberculous process seems to have been most advanced in the kidney. From these facts it is strongly suggested that in children genital tuberculosis is exceptional, that cases of ascending infection occasionally, but rarely, occur, and that nearly all cases are of the descending type,—that is, primary in the kidney.

The disease is most often unilateral, nearly always so in the beginning. When both kidneys are involved it is more advanced in one than the other. In the accompanying cases one kidney is found affected twenty-five times, and both, thirteen times. In the remaining cases the records are deficient. Of the twenty-five single cases the right kidney is found affected twelve times, the left twelve, and in one case the side is not specified. In the thirteen cases in which both kidneys are involved the right seems primarily affected six times, the left three, and in four it is impossible to determine. In the thirty-three cases, therefore, in which the records give evidence, the right was first involved eighteen and the left fifteen times. This finding accords with the view held by most writers. Facklam, who, unlike other writers, found females more often affected than males, also found the left

kidney more frequently the primary seat than the right. Borrell was able to produce primary renal tuberculosis experimentally by injecting cultures into the aorta.

Duret compares the kidneys, the essential organs of cleansing, to a filter which collects the microbes in their passage through the circulation. In primary tuberculosis of the kidney Koch's bacillus, traversing the entire organism, is retarded upon the filter, where it forms colonies, as the result of which tubercles are developed in the region of the blood-vessels and glomeruli. Durand-Fardel and Baumgarten are said to have recognized the presence of the bacillus tuberculosis in the blood-vessels before there was any tuberculous deposit.

In view of the facts referred to it is apparent that primary renal tuberculosis may occur by hæmatogenic infection without discoverable tuberculous lesions in other parts of the body, and inquiry is directed by this conclusion to the question of the mode of entrance of the bacilli into the circulation in such cases. Without entering into the large and interesting studies of cryptogenetic tuberculous infection it will be well in this place to consider briefly the possibilities and modes in which such might occur. Reference may be made in the first place to the instances of general miliary tuberculosis without discoverable localized foci from which infection could have taken place. It is, of course, probable in such cases of sudden and extensive infection of the blood with tubercle bacilli that some localized lesion had existed and been overlooked. Careful investigations in such cases would doubtless often disclose the existence of a limited focus of tuberculosis in a lymphatic gland, the testicle or epididymis, the prostate gland, the tubes or ovaries, the mucosa of the nose, or in other regions where it might be overlooked. It is of interest also in this connection to refer to the recent investigations of Dieulafoy, Krückmann, Tusseau, and others which demonstrate the comparative frequency of unsuspected tuberculosis of the tonsils. Cases, however, of localized hæmatogenic tuberculosis in a single organ would point rather to infection with a lesser number of bacilli and of a more gradual character than would be likely to occur from the sudden discharge into the blood of the contents of a small tuberculous focus. I am led to think, in this connection, of the possibility of the entrance of tubercle bacilli into the circulation without the development of localized lesions at the portal of entrance. That such an occurrence is possible need scarcely be detailed at length, in view of the investigations of Loomis and others, and in view of the general experience of pathologists showing the frequency of caseous tuberculosis of the bronchial glands without discoverable lesions in the lungs or elsewhere. There is little doubt but that in such instances the bacilli penetrate the alveolar walls and, gaining access to the lymphatic channels, are conveyed to the bronchial glands without having occasioned disease at the point of entrance. The same possibility of cryptogenetic infection through the gas-

tro-intestinal tract is evidenced by the frequency of tuberculous disease of the mesenteric glands without the occurrence of intestinal lesions.

While these facts seem incontrovertible, it must be admitted that infections of this kind have not been demonstrated to be of frequent occurrence; at least, in so far as tuberculous lesions at a distance from the possible portals of entrance are concerned. Nevertheless, the possibility exists, and it must be borne in mind in cases of tuberculous disease of deep-seated organs in which the mode of infection seems obscure.

PATHOLOGICAL ANATOMY.

The tubercles, once begun, usually develop with marked rapidity; the glomeruli and tubules become involved, caseous and purulent degenerations occur, the softened tubercle is eliminated into the pelvis, the pelvis participates in the inflammation, a consecutive suppurating tuberculous pyelitis develops, and thus the entire kidney structure is transformed into a tuberculous mass.

The two kidneys may be simultaneously infected, but usually the disease advances more rapidly in one than in the other. Again, it is possible for one kidney to be secondarily infected by a process of extension from the other kidney. The tuberculous virus is conveyed to the bladder by the urine, the mucous membrane of the trigone becomes tuberculous and thickened, the ureter from the healthy kidney is infected, its mucous membrane thickened, its lumen obstructed, and a damming up of the urine results, and a consecutive dilatation of the ureter and pelvis. The tuberculous virus is thus elevated to the level of the kidney, brought in contact with the pelvis of the kidney, and infection follows. The same result may be obtained by dilatation from vesical retention. Admitting this process of extension, it is not essential that disease of the bladder should exist in order to involve the second kidney through the medium of the bladder and ureters. The mucous membrane of the bladder is not a very delicate membrane, relatively speaking, and there seems abundant evidence that it can remain for a long time in contact with the tuberculous virus without becoming infected.

It is reasonable, therefore, to suppose that in an advanced stage of unilateral degeneration, where there is extensive caseation with suppuration and the discharge of thick, purulent, shredded urine, temporary blocking of the urethra might readily occur without infection of the bladder, but with a consequent dilatation of the bladder, ureter, and pelvis. The infected urine would thus be elevated to the kidney level, and brought in contact with a kidney probably the seat of a parenchymatous nephritis, and therefore predisposed and much more susceptible than the lower urinary mucous membrane. The possibility of ascending infection of this character must be admitted, and is illustrated by the experimental evidences of Albarran, above recited.

The external surface of the kidney, in some instances, conveys nothing.

There may be but little variation from the normal. Usually, however, there is more or less augmentation in volume, the increase depending upon the age of the lesion. There may be, as in Case VI., an extensive tumor-formation, the result of a hydro- or pyelonephrosis from an obstructed ureter. On the other hand, as in Case XLVIII., the volume may be greatly lessened, the result of an atrophic process. The kidney shape is usually retained. The surface may be smooth or, as is more common, embossed, the embossments corresponding to the position of the tubercles or distended caverns.

Quite distinct alterations occur in the capsules. The so-called adipose capsule, the perirenal tissue, is, at times, greatly thickened, and may add considerably to the bulk of the tumor. In an instance cited by Tuffier, where tumors existed, the kidney was found atrophied and almost buried in the thickened capsule. This thickening is the result either of a simple adiposis or of a sclero-adiposis. The latter condition is well illustrated in the kidney of my own case.

Perirenal abscess is observed with rather marked frequency, nine times in the cases here presented. These abscesses are due to perforation of the true kidney capsule by pus from points of suppuration in the kidney structure, as the result of which a tuberculous process develops in the perirenal substance, or they may develop as the result of a propagation of the tuberculous virus through the medium of the lymphatics (Albarran). These abscesses vary in size and are usually of slow development. They extend in various directions, either descending into the iliac fossa or ascending in the direction of the diaphragm, sometimes perforating it and giving rise to empyema. They may point externally or perforate into the adjacent viscera. The abscess cavity is irregular and often sacculated. The sacs may or may not communicate. Caseation occurs, as in tuberculous processes elsewhere. The caseous remains adhere to the walls or float in the liquid of the abscess. The liquid may be serous or sero-sanguineous in the early history of the lesion, especially where infection occurs through the lymphatics, but suppuration soon develops, and we have purulent contents of a urinous odor.

The true kidney capsule is usually somewhat sclerosed and thickened, at times extensively. After caseation has advanced it may become detached from the surface and elevated at points. Often it is so adherent to the thickened perirenal adipose tissue that it is impossible to separate it. It is apt, also, to be adherent to the renal substance, detachable with difficulty, the surface being covered with adherent particles of degenerated kidney tissue. Subcapsular abscess occurs occasionally when the true kidney capsule is so resistant from sclerotic changes that the pus from suppurating points in the kidney is unable to perforate it. (Vigneron.) The capsule removed, the surface is seen to consist of abscess cavities, a mass of huge tubercles, or to be studded, here and there, with small tuberculous notches, depending upon the age of the lesion.

PLATE III.



Showing extensive thickening of ureter; dilatation and thickening of the pelvis, with tuberculous incrustation of the mucous membrane and tuberculous degeneration of the apices of the pyramids; the eventual condition in those cases in which the infection has been primary in the pelvis or in which it has extended from the lower urinary organs.

PLATE II.



Extensive abscess formation; the two largest abscesses communicating with each other and with the pelvis of the kidney; no involvement of the pelvis.

The cut surface of the caseous tuberculous kidney presents lesions in accordance with the age of the disease. From the *post-mortem* findings it is oftentimes difficult to tell in what part of the organ the disease has begun. In primary tuberculosis, the infection being through the blood-vessels, in the early stages we find young tuberculous granulations in the cortex and at the bases of the pyramids, especially in the region of the blood-vessels and glomeruli. These tubercles gradually increase in size, infringe more and more upon the kidney substance, become caseated, softening occurs, and we have the formation of cavities resulting. In the earlier stages the cavities are separated by rigid septa, which frequently have the naked-eye appearance of healthy tissue, but which show microscopically either no trace of kidney substance or small portions of corpuscles or of uriniferous tubules smothered up in fibrinous tissue. (Plate II.)

The cysts vary in number and size. There may be as many as ten or twelve in a single kidney. They sooner or later communicate among themselves and with the pelvis, and eventually the septa may be destroyed entirely, and the kidney becomes converted into one huge cyst with more or less thick walls and ragged internal surface due to the remains of the original septa. The internal walls of the smaller caverns are ragged and irregular, of a grayish color, more or less covered with caseous material, and in old cases at times with calcareous concretions.

The contents of these cysts vary. They are sometimes sero-sanguineous, of urinous odor, with a chalky or cheesy deposit. More often they are purulent, either yellowish, whitish, or dirty-gray in color, sometimes blood-tinged, and of a urinous odor. The sediment is chalky or cheesy. It contains particles of degenerated tubercles, remnants of kidney structure. Sometimes, according to Vigneron, small calculi of phosphate or carbonate of lime have been found, and Morris has noted collections of cholesterin. Pus-cells, blood-cells, granular amorphous matter, and tripple phosphates are commonly demonstrable. Koch's bacillus has been shown in the earlier stages of cyst-formation, but after the condition is well advanced only the micro-organisms of suppuration are apparent.

The pelvis of the kidney may, and, sooner or later, usually does participate in the process. Occasionally it constitutes the point of primary focus. In the earlier stages it is healthy. As tubercularization advances and the glandular substance becomes augmented in volume it is not uncommon for the pelvis to be infringed upon and much reduced in size. After communication between the pelvis and the pus-containing caverns is established the pelvic mucous membrane becomes infected. It may be studded with tubercles or greatly thickened. It may be granular and not infrequently is incrustated with a heavy, closely adherent, grayish or grayish-yellow tuberculous membrane. Erosions may exist here and there. Dilatation of the pelvis, either as a result of obstructed ureter or urethra, is common. It is frequently found to contain purulent urine with cheesy and tuberculous deposits. In very advanced cases the communication between the glandular

substance and the pelvis becomes so intimate that the outline of the pelvis is entirely lost. (Plate III.)

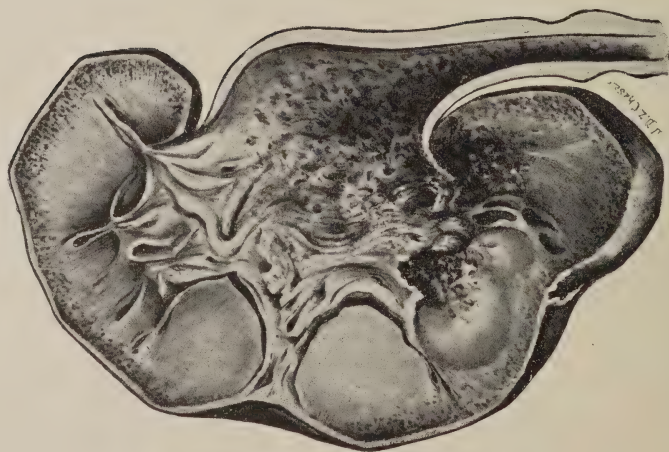
The ureter is sooner or later involved in the tuberculous process and partakes of much the same changes as those found in the pelvis. Its walls are frequently much thickened, its canal obliterated, forming a thick, non-canalculated fibrous cord. In other instances there are areas of localized thickening resulting in obstruction with extensive dilatation and consequent thinning of the walls in the parts above. Cheesy masses, blood clots, and membranous shreds sometimes destroy the lumen of the canal.

The tuberculous process may be abruptly limited at the opening into the bladder, but usually, where the disease is at all advanced in the ureter, some changes are apparent in the wall of the bladder. These alterations consist most commonly in a slight thickening of the mucous membrane in the surface of the trigone or about the neck of the bladder. Extensive involvement of the mucous membrane is uncommon. In some cases the walls are thickened throughout or the mucous membrane may be studded with minute, superficial tubercles, many or all of which are ulcerated. There may also be extensive incrustation of the mucous membrane.

The second kidney being involved by ascending infection is first affected in the pelvis and calices. Obstruction of its ureter with extensive hydro- or pyonephrosis is very common. The apices of the pyramids are the first part of the glandular substance to be involved. After the disease is well advanced, it may be impossible to tell, from the appearance of the kidney, in just what part of the kidney the infection primarily occurred. The cortex, however, usually remains intact. Where the tuberculous process has not invaded the second kidney, we frequently find it the seat of an amyloid degeneration.

It is most difficult to determine from the pathological appearances the probable starting-point of urinary tuberculosis. If one finds the mucous membrane of the bladder extensively ulcerated and tuberculous, or its walls incrustated with a dense tuberculous membrane and the ureter thickened and tuberculous, its lumen perhaps destroyed, the pelvis dilated and thickened, and the involvement of the glandular substance limited to the apices of one or two pyramids, it is probable that the disease has originated in the lower urinary organs, and that the kidney is secondarily infected. On the other hand, if the conditions presented are similar to those in my own case it is a matter of no difficulty to determine that the condition has had its origin in the kidney. As a matter of fact, and unfortunately, these are not the *post-mortem* lesions that most often confront us. Usually the kidney is so far involved that but little if any normal kidney tissue is left. There may remain, however, a portion of cortex; or, in the upper portion of the kidney, as is not uncommon, a partially infiltrated pyramid. In such cases as these, where we have an accompanying involvement of the bladder and ureter, the determination of the particular form of infection becomes ex-

PLATE IV.



Mixed infection: showing on the surface of the kidney the remains of a tuberculous abscess, which has partially healed by a discharge of its contents into the pelvis. This having resulted in an infection of the lower urinary organs, an eventual reinfection of the kidney has occurred by the ascending process, giving rise to the same condition illustrated in Plate III.

PLATE V.



Case of Drs. D. D. Stewart and A. O. J. Kelly, through whose courtesy I use the illustration: a very remarkable case of primary involvement of the pelvis of the kidney. Tubercle bacilli were discovered in the urine during life and in the post-mortem contents of the bladder and pelvis; most careful examination excluded the existence of tuberculous deposits in other organs.

ceedingly difficult, if not impossible. Where the kidney tissue is entirely destroyed, also, we have no clue to the beginning.

The possibility of a mixed infection does not seem to have been considered. It is reasonable to believe that a limited area of tuberculous involvement of the kidney, of vascular origin, might advance to the stage of softening, the softened material be evacuated into the pelvis and lower urinary organs, the kidney lesion thus becoming checked or cured. The lower urinary organs in the mean time having become infected, we have obstruction of the ureter, the tuberculous virus is elevated to the kidney level, the pelvis becomes dilated and infected, the apices of the pyramids are involved, and we have the pathological picture of an ascending infection or a secondary kidney involvement, when in truth the primary focus has been in the kidney. (Plate IV.)

The fact that Albarran has been the only person who has succeeded in producing ascending tuberculosis experimentally, the great infrequency with which isolated bladder tuberculosis has been observed, and the fact that in almost all cases of combined tuberculosis of the kidney and bladder the kidney lesion seems the more advanced, go to show that the ascending form is infrequent. It would seem, therefore, that, where the post-mortem findings leave the question in doubt, it is safe to decide in favor of a descending infection.

SYMPTOMATOLOGY.

In the early stages the symptoms are so slight as not to attract attention. Rilliet and Barthez say it sometimes passes unnoticed. Rosenstein makes the statement that symptoms occur only when the mucous membrane of the calices and pelvis becomes inflamed, or when the softened centres in the kidney discharge into the pelvis. Szumam believes that a tuberculous deposit in the midst of the kidney tissue, not yet suppurated, usually gives no special symptoms. In my own case there were never any symptoms referable to the kidney, and, as is readily apparent, there has been very extensive destruction of the glandular substance, but no involvement of the pelvis. The first manifestations of the condition are those found in connection with the urinary apparatus. Harrison found incontinence and urinary irritability among the earliest symptoms. He suggests that the condition is more common in children than is generally believed, and advises that every case of nocturnal incontinence be carefully studied with a view to establishing renal tuberculosis. A slight sense of pain in the loins and a little blood in the urine are easily observed.

Pain, varying in character and location, is probably one of the most constant manifestations. It may be of a dull, aching, almost constant character and limited to the lumbar region. Usually it is confined to or more manifest on the side of the diseased kidney. It is frequently paroxysmal, the paroxysms varying in degree of intensity and in duration, and is either limited to the kidney region, or, following the course of the ureter, it shoots downward and extends to the testicles or tip of the penis. These periodic

attacks are sometimes of slow approach, and again come on with great suddenness, closely simulating renal colic from the passage of stone, this simulation doubtless being due to the existence of like conditions, the passing of a clot or tuberculous mass through the ureter. Retching is not uncommon in these paroxysms. The pain is increased by pressure. In one case in the series it was induced only by pressure. Motion and position of the body have a like effect. In several cases the position of scoliosis was assumed in walking in order to relax the muscles and thus overcome the pain of motion. In Case II., lying on the affected side produced discomfort. Pain at the neck of the bladder is very common, and manifests itself chiefly before and during, and sometimes, also, just after micturition. It varies in degree of intensity in proportion to the amount of bladder involvement and the character of the urine. Thick, purulent urine, containing shreds and clots, increases the pain by creating vesical spasm. This pain is so intense at times that it gives rise to screaming and shuddering during urination. Involvement of the bladder and the changes in the urine just specified give rise also to other changes in micturition, the most common being increased frequency and incontinence. In some cases the desire to urinate is almost constant. The quantity of urine may be increased or diminished. In Case XII., reported by Dufour, polyuria existed with polydipsia, and a diagnosis of diabetes was made. Retention sometimes exists, the result of blocking of the urethra by clots or shreds, or from vesical spasm. Difficulty in voiding urine seems quite common in children, and to overcome this, pulling at the foreskin, an attempt, as it were, to milk away the thick,ropy urine, is resorted to.

Hæmaturia occurs at all stages. It may be abundant or slight. It sometimes accompanies the spasmodic pains, and may be induced by exercise, but usually is not associated with either. The character of the urine varies. It frequently is normal. After a long-continued, purulent flow, it may abruptly show no abnormality, the result of blocking of the ureter. The color may be cloudy, smoky, or muddy; the odor fetid. The sediment may be copious, white, yellowish- or pinkish-white, or muddy in color, and is due to the pus, urates, phosphates, clots, and cheesy matter. The reaction is usually acid, sometimes alkaline from ammoniacal decomposition. The specific gravity is slightly subnormal. Albumin in small quantity is common, due to the blood and pus. Tapret, on the other hand, says it is exceptional. Du Pasquier finds it very rare, and from this fact concludes that the concomitant alterations of the epithelium, of the arteries, and of the connective tissue are very rare. The quantity of albumin is increased when parenchymatous inflammation of the second kidney occurs. Under the microscope pus and blood are rather constant. Rosenstein says they are always found even when the urine is clear. Granulo-fatty casts may exist, leucocytes and the remains of degenerated epithelial cells from the kidney and bladder, calcium oxalate, and phosphatic crystals are found. Fagge, Ebstein, and Rosenstein lay special stress upon the diagnostic value of

the presence of connective and elastic tissue fibres, and a granulous, meal-like, brittle mass which appears under the microscope in the form of small nuclei, and is insoluble by heat or any sort of acid. Bacteriological examination of the urine may lead to the discovery of Koch's bacillus.

Tumor was observed in twenty-three of the cases, varying in size from a slight increase above the normal to that of a child's head. It is due either to tuberculous overgrowth of the glandular substance, as in my own case, to dilatation of the kidney from obstruction of the ureter, to an adiposis or fibro-adiposis of the perirenal tissue, or to perinephritic abscess. The kidney form is generally retained, the surface is bossellated, it may be elastic and fluctuating, or hard and resistant, depending upon the cause of the tumor. Tenderness to the touch is common, and there is dulness on percussion over the mass. When dependent upon obstruction of a ureter by clots it varies in size from time to time, and may disappear and remain absent for a period of weeks to recur in the event of reblocking of the ureter. These tumors are deep-seated in the abdomen, and do not move during respiration. When the mass is large the abdominal veins are prominent, and there may be pressure symptoms.

Constitutional symptoms manifest themselves, but usually in the later stages of the disease. They consist in loss of flesh and strength, colliquative sweats, more or less marked anæmia, at times a distinct cachexia, and pyrexia, which may assume a hectic type. This last symptom is especially emphasized by Reginald Harrison as of great diagnostic value in connection with the urinary symptoms. Death results from exhaustion, from profound tuberculous toxæmia (Aviragnet), from perforation of the peritoneum or adjacent viscera by a distended pelvis or perirenal abscess, or from some one of the various complications, such as uræmia, tuberculous meningitis, or general tuberculous infection. The uræmic attacks are due either to the tuberculous condition or to a concomitant parenchymatous change. If dependent upon retention from blocking of the ureters, they are likely to have an intermittent course. Incessant vomiting, diarrhœa, dyspnœa, mild muttering delirium, convulsions, somnolence, and coma have been the usual uræmic manifestations.

DIAGNOSIS.

The early diagnosis is difficult, in some cases well-nigh impossible, but extremely important. The condition is rare in children, frequently without symptoms, and therefore apt to be overlooked. There is only one absolutely positive sign—the discovery of Koch's bacillus in the urine—when other microscopical constituents point to an affection of the kidney. The bacillus is difficult of demonstration. It should be carefully sought for in all suspicious cases, and cultures should be made from the urinary sediment. Von Jaksch advises resort to Koch's method of plate cultivation to obtain the various micro-organisms in an unmixed condition. The

inoculation of animals will resolve doubt as to character of the specific organism obtained.

Philipowicz has discovered isolated specimens of the bacillus in the urine in miliary tuberculosis where there were no tuberculous ulcers in the genito-urinary passages, a fact well worth bearing in mind.

Where early symptoms exist, dull aching, more or less constant pain in the loins, occasional slight hæmaturia, with almost constant microscopic evidences of blood and pus, and increased frequency of micturition with nocturnal incontinence are among the most suggestive.

In the later stages the symptoms are more distinctive; the lumbar pain, the severe incontinence and hæmaturia not influenced by exercise, the purulent urine containing the above-described granular, amorphous masses insoluble in acids in combination with elastic fibres and shreds of connective tissue, and eventually, tumor-formation, and the development of general symptoms make the diagnosis quite possible.

The conditions in childhood which are most apt to be confounded with primary renal tuberculosis are renal and vesical calculus.

From Renal Calculus.—In renal calculus there is usually a family history of gout or gravel. The symptoms are incontinence and urinary irritability increased by exercise, dull, aching pain following exercise, frequent attacks of paroxysmal pain much more agonizing than the colics of tuberculosis, and followed by bloody urine; hæmaturia is more severe and increased by exercise as well as by colics. The health is good between the attacks unless pyelitis develops, and this is always late; tumor formation is rare. The specific gravity of the urine is above the normal, the reaction is acid, the pus sediment from pyelitis separates more clearly from the supernatant urine, the pus is more laudable, and is sharper in microscopic outline. Gravel is observed in the urine, numerous crystals of uric acid or oxalate of calcium are found, casts are less common than in tuberculosis, and bacilli are absent. Bruce-Clark suggests exploratory puncture as a means of removing all doubt.

Stone in the bladder is excluded by examination with the sound.

Sarcoma of the kidney may mislead. This affection is more rapid in development, the tumor is often of enormous dimensions, the surface is smooth and elastic, the kidney-shape may be lost. The urinary symptoms are negative unless there be an occasional hæmaturia. Examination of the tissue obtained by exploratory puncture has been resorted to. In two of the cases a diagnosis of tuberculous tumor of the mesentery was made; the absence of the lumbar pains, of urinary irritability and changes in the urine, the shape of the tumor and its probable mobility should exclude chronic tuberculosis of the kidney.

PROGNOSIS.

Prognosis is, without operative interference, usually fatal. Nephrotomy and nephrectomy have done much to diminish the death-rate. Some-

times cicatrices form. The condition, instead of progressing to caseation, follows another course: a true organization is established, fibrous tissue is formed, and a cure obtained (Fagge and Gaultier). In other cases softening happens, and the contents of the tuberculous pouch, instead of undergoing fatty degeneration and being eliminated, become indurated. The balance of the kidney secretes urine, and the condition gives rise to no symptoms (Gaultier). Newman says, "Should only one organ be affected the kidney may, by a drying up of the contents of the pyonephrosis, become converted into a shrivelled, putty-like mass." The other kidney may continue healthy, and the patient live indefinitely. Roberts thinks tuberculous masses are occasionally evacuated by the urinary channels in the same way that similar masses in the lungs are sometimes disposed of by the bronchial tubes, thus bringing about a cure. Dickinson and Bruce-Clark support this view. The modes of fatal termination have been described. The duration of the disease is usually from six months to two or three years. It is sometimes very chronic, with intervals of fair health followed by exacerbations. Dr. Thomas Smith refers to a case of Mr. Warrington Hayward, which was under observation for eighteen years.

TREATMENT.

The medical treatment of the disease is that of tuberculosis in other organs, and is quite as unsatisfactory in its results.

It is not the purpose of this paper to take up the surgery of primary tuberculosis, but it does seem proper to briefly relate the results obtained in the seventeen cases upon which operations were performed. Nephrotomy was done four times, with two recoveries, one improvement, and one death. Nephrectomy was done nine times, with five recoveries, one improvement (died later from perforation of the duodenum), and three deaths from the effect of the operation. Nephrotomy followed by nephrectomy was resorted to in four cases; two recovered, one died, and one improved. All of these operative cases were very far advanced, and were, therefore, not good cases. Of the two nephrotomies that recovered, one had pyelitis and perinephritic abscess, and the other abscess of the kidney. Of the cases of nephrectomy which recovered, in one the kidney was a loculated sac containing foul-smelling pus, in two others the kidney was enlarged. Perirenal abscess existed in one, and in the fifth the kidney was not described. In the case which died from perforation of the duodenum, a large perinephritic abscess was first opened, and, later, a cystic kidney removed. Marked improvement had occurred in this case. Of the two cases of nephrotomy followed by nephrectomy which recovered, one had perirenal abscess and abscess of the kidney. In the other case the lad's condition was miserable. A perineal section was first resorted to for the relief of a tuberculous cystitis; later, nephrotomy was done to relieve a pyonephrosis. Marked improvement resulted, and finally the kidney was resected. The boy recovered, with the urine clear.

If such results are possible in these far-advanced, suppurating, unpromising cases, it would certainly seem that resection of the kidney at a time when the disease is absolutely localized, before softening has begun,—in the earliest stages, in other words,—offers an almost certain cure. The question, therefore, resolves itself into one of early diagnosis, and lays much of the burden of responsibility at the door of the medical man, for in the majority of instances these cases first come under his notice.

REPORTED CASES.

Reported by Dr. Cooper, *Medical Times and Hospital Gazette*, London, 1880, vol. ii. p. 588.

CASE II.—Girl, aged eleven years; illness began, in 1879, with pain in right loin. Lost flesh and strength; urine always turbid when passed; micturition same as in health; no pain over bladder; discomfort on lying on right side; tumor in loin.

On admission to hospital, more or less solid mass in right iliac and lumbar regions; visible fulness to right of and below the umbilicus; no marked swelling; pain on right side in grasping the loins posteriorly; slight pitting of legs on pressure; urine voided three or four times a day, one-third its volume in pus; tumor fluctuates, movable; no symptoms of cystitis; urine acid. A diagnosis of strumous kidney dilated with pus was made. The pus was withdrawn by incision. Quantity of urine and percentage of solids normal; no renal insufficiency; amount of albumin very small; temperature normal in the morning, up in the evening; highest point 102° F. The thoracic organs seemed healthy. Nephrectomy was performed; kidney contained dark-colored, foul-smelling pus,—it was a loculated sac. The ureter was not affected. Recovery.

Barker, *Lancet*, 1885, vol. i. p. 141.

CASE III.—Boy, aged nine years. History of three years' illness. *Symptoms:* Pain and difficulty in micturition; pain in right side; hæmaturia; paroxysms of pain gradually increasing in intensity, felt in loin and tip of penis; severe retching during pain; no vomiting; urine not always bloody after attacks; usually becomes so gradually, and at times is almost pure blood; urinates five to six times daily; never increased frequency; always a delicate boy; much bronchitis in infancy. Father asthmatic and catarrhal; other children strumous.

Urine: Bloody, acid; specific gravity, 1025; contains crystals of calcium oxalate and red and white corpuscles. Physical examination shows no tumors. Diagnosis of stone was made, as three years' standing without tumor and bleeding after manipulation seemed to exclude a new growth or tuberculous process. An operation was done. Kidney punctured; nothing found. The rest following this operation relieved him for some months, when hæmaturia recurred; later improved again. A diagnosis of a small tuberculous deposit or ulcer in the ureter or pelvis was made.

J. A. Hobson, *Cincinnati Lancet and Clinic*, October 10, 1885.

CASE IV.—Boy, aged thirteen years. First seen September, 1883. Mother had tuberculosis at time of his birth, and died six months later. One aunt tuberculous; nocturnal incontinence since childhood. No pulmonary symptoms; tenderness over left kidney; no tumor palpable; desire to urinate almost constant; intense pain on micturition; exercise increased the pain and tenderness in the left lumbar region and the pain on micturition; renal calculus was suspected.

Urine: First examination, specific gravity 1005, acid; amount in twenty-four

hours not exceeding one pint; albumin; pain on micturition grew more constant; patient more cachectic; urine became purulent; occasional vomiting; slight fever. A later examination of the urine found it purulent; small in amount; specific gravity 1004. Eventually, urine was completely suppressed. Respirations fell to six per minute two days before death. Jactitations, delirium; no convulsions; death. During the last three days there was a discharge of pure pus, without urinous odor, from the bladder.

Necropsy.—*Left kidney*: Slightly larger than normal; capsule closely adherent; practically a sac occupied by a collection of thick pus; surface lobulated; no vestige of secreting structure, only a layer of cortical substance two lines in thickness; contained a soft, pasty mass resembling the contents of a sebaceous cyst. The walls of the ureter were thickened. *Right kidney*: Greatly enlarged, infiltrated with tubercles in various stages; on and near the convex border were large patches, some an inch in diameter and some softened in the centre; near the pelvis were numerous small abscesses, some of which opened into it, filling it and the ureter with pus; on removing the pus the lining membrane of the pelvis is granular, and this condition extends into the ureter; capsule easily detached. The structure of the kidney is everywhere infiltrated with fine granular matter. *Bladder*: Walls thickened throughout; no deposit of tubercle observed; other abdominal organs normal.

Dr. C. Bohm, *Jahrbücher für Kinderheilkunde*, vol. xix. p. 205.

CASE V.—Boy, aged four years; admitted to Children's Hospital September 23, 1882. Always a sickly child. Maternal aunt died of pulmonary phthisis. Child fell down-stairs when one and a half years old, at which time he might have injured the left renal region. The urine has been cloudy for more than a year, and was thought to contain pus. For nearly three weeks, three-fourths of a year ago, the flow of urine had been reduced. The swelling in the left lumbar region had been remarked five weeks before admission. No fever or night-sweats had been observed.

Present condition, September 25, 1882. Unusually developed for his age; has fallen away in flesh; relaxed carriage; anæmic; urine voided in normal manner and quantity; no albumin; no sediments.

In the left lumbar region, between the last rib and the iliac crest, is a diffuse swelling the size of a man's hand. The skin over it is red; it fluctuates and is painful to the touch. The belly is swollen and sensitive. The left thigh is on the hip-joint in moderate flexion and cannot be easily stretched. The lumbar segment of the spine is somewhat scoliotic. Temperature in axilla, 37.9° C.

October 4. Abscess was incised and a thick stream of odorless white pus exuded. Microscopically, it showed pus-cells, granular matter, fat drops, and detritus. The kidneys were felt in the abscess cavity. October 10. Urine gave slight turbidity with nitric acid and boiling. Died October 12.

Autopsy.—Cheesy bronchial glands at tubes of right lung; two small, cheesy glands by the trachea. Right kidney large; capsule easily detached; surface smooth; doughy consistency; yellowish color; cortical and pyramidal substance nearly alike in color. In the region of the left kidney is an irregular, diffused swelling half the size of a child's head. In the mass is a body which corresponds to a somewhat enlarged kidney, and is very adherent to the surrounding tissues. All the tissues around the kidney are greenish in color and easy to tear. Between the lumbar fascia and the skin is a large cavity which is opened into by the operative incision. No bone-disease. The ureter is the thickness of the little finger, and, on cutting, discharges a creamy fluid which resembles the pus from an abscess. The kidney capsule is not detachable.

The cut kidney shows entire absence of renal structure. The pelvis is distinctly

recognizable. The form of the individual pyramids is shown by rigid septa. These surround cavities with irregular walls. These are almost filled with the cream-like pus above described. After this has exuded there remains in the cavities a whitish, dry mass which is cheesy in consistence. In the wall of the pelvis are many grayish-yellow miliary tubercles the size of a pin's head.

The ureter is entirely obstructed in its upper part by a cheesy mass. Its opening into the pelvis admits only a very thin sound. The lower part of the ureter is also filled with a cheesy mass and is much enlarged. Its opening into the bladder is contracted. Four centimetres above the entrance into the bladder, in the walls of the ureter, are found a number of yellowish-white and gray tubercles arranged circularly as in the pelvis of the kidney. The bladder and other genito-urinary organs are free from tubercle. There is a small abscess in the rectum and a few transparent gray tubercles near by. No pathological changes elsewhere.

Dr. F. Ammon, *Schmidt's Jahrbücher*, vol. i. p. 320.

CASE VI.—Girl, aged three and a half years; scrofulous constitution; mother died of phthisis; hectic fever, advanced emaciation, cough, catarrh of head, tumor. Admitted to the Dresden Hospital in September, 1829. Emaciation; left abdomen prominent. In the left iliac and lumbar regions is a swelling the size of a fist, deeply located, not movable, painful to touch, kidney-shape; abdominal veins prominent. In walking, the child has the position of scoliosis. Child had fallen eight days before, and complained of pain in the region of the bladder for one day. Passed water when she laughed, sat, or stood.

A diagnosis of general, scrofulous, tuberculous deposit in the left kidney was made. No signs of disease of other organs.

On December 15 she developed violent pains in the tumor, and it was again enlarged. Had fever and some vomiting. Swelling soon subsided. At the end of the following January, fever and general symptoms became aggravated; tumor again increased in size, painless; abdominal veins over tumor much enlarged; urine still normal. Child better and the swelling decreased by the end of February.

Examination, April 10, 1830. Swelling had extended downward so much that the borders could not be defined definitely. It was quite to the iliac crest, and upward it extended beneath the short ribs and pushed them forward. Surface irregular, hard, insensitive to pressure. The tumor condition continued the same until June. The general condition improved. From June 3, grew weaker, tumor increased and became softer. Pulse rapid and small. Urine had a fetid odor, and had a scaly, straw-yellow, mucus-like sediment. Otherwise normal. By the end of June the body was withered. Lower abdomen much inflated, swelling increased constantly, and was harder and more irregular than ever. The right kidney showed an increase in size. Urinary secretion was not disturbed. There was much fever, with colliquative sweats. More pain, alternating improvement and relapses. Tumor increased in size. Child became comatose and died in convulsions.

Necropsy.—Thoracic organs normal. Some serous fluid in abdominal cavity.

Left kidney formed an extraordinarily large tumor, the size of a child's head. It filled nearly the whole left abdominal cavity; was adherent to the ribs and spinal column. The degenerated, ball-shaped kidney showed little trace of its original shape. It fluctuated on palpation and showed tuberculous degeneration of the whole internal substance. The calices were much dilated; the tuberculous mass was yellow and much softened. No blood-vessels or hemorrhages apparent. The left ureter was irregular, walls thick, here and there single tubercles surrounded by a cellular tegument; its canal was obliterated.

The tuberculous metamorphosis extended from the left to the right kidney, the region of the vessels being surrounded by small tubercles. No other organ tuberculous.

Reported by Vernois and quoted by Rayer in his "*Maladies des Reins*," vol. iii. p. 672.

CASE VII.—Boy, aged twelve years, brown hair and eyes, admitted to Children's Hospital July 6, 1836, with obstinate diarrhœa, with intense abdominal pain, and excessive tenderness on pressure. Much emaciated for some time past. Diagnosis of tuberculous peritonitis with tuberculous ulceration in the intestine was made. No signs of tuberculosis in the chest. Urination easy and natural. Urine not examined. July 21, developed right-sided pneumonia, later left, and died on the 29th.

Autopsy.—*Lungs*: Red softening of two-thirds of posterior and inferior parts of both lungs. No tubercle in lungs or bronchial glands. Tuberculous peritonitis. Mesenteric glands large and tuberculous.

Intestine: Mucous membrane covered with ulceration two feet above and below the cæcum with tuberculous matter at their bases. *Left kidney* with urethra and bladder removed together. The kidney was very voluminous. Vertical incision made, and grayish thick fluid escaped from its upper part which filled a cavity communicating with the pelvis. The organ was overrun with tubercles. The surface showed mixed anæmia and hyperæmia; it was the shape and size of an adult kidney; weighed four ounces after the incision. The external membranes detached, a certain amount of tuberculous matter remained adherent to it. The anterior surface of the kidney was strewn with white spots, some protruding, others not; almost all were round and the size of a millet-seed. Most were solid, a few were surrounded by a small areola exactly like the purulent points. The others, especially those in the anæmic points, did not have any areola. In the posterior surface of the kidney we could also see white protruding and solid points, much injected, especially in half of their superior portion, and towards their convex borders. A magnifying glass showed the redness due to a very fine pigmentation and very loose arborization. In the inferior part of the kidney were three tubercles more voluminous and which corresponded to a true tuberculous cavern and had three depressed or destroyed cones. The cortical substance, which was mottled in appearance, by anæmia and hyperæmia, contained also a large number of tuberculous granulations. Their centres were softer than the external portion, but they could not be enucleated and separated from the kidney substance without being torn. The cortical substance near the convex border of the kidney was very much tumefied and slightly softened in several places. In the anæmic centres it was much more consistent. The elevations of the cones were almost all depressed or destroyed. The calices, which were incrustated with tuberculous matter, were dilated. Their cavities and that of the pelvis were entirely unrecognizable. They showed a yellowish-white, irregular coloration, and had the appearance of a tuberculous cavern. The ureter walls were thickened and its inner surface was incrustated with tuberculous matter. The renal vein was healthy. *Right kidney*: No alterations and its ureter not dilated. The mucous membrane of the bladder showed a large number of circular, ecchymosed, and small blackish lines. Towards the orifice of the left ureter were slight traces of tubercle. Mucous membrane was much thickened.

R. Clement Lucas, *Transactions of the London Pathological Society*, vol. xxvi. p. 129.

CASE VIII.—Delicate girl, aged seven years, looking much younger. First observed November 16, 1873. Fair complexion. Illness began with an attack of pneumonia in February, 1874. Following it there was debility and loss of appetite, fever, thirst, hot skin, and flushing of face at night; constipation. Early in June she developed a diarrhœa, which continued until death, the stools being at first dark, but later, clay-colored and offensive. Pain in the right side of the abdomen with tender-

ness on pressure. Early in August had great pain and tenderness in the abdomen with increased fulness and abnormal firmness to the right and below the umbilicus.

Two weeks later a distinctly circumscribed tumor was discovered which could be traced upward into the right hypochondrium and back towards the loins. Urine normal. Abdominal tenderness and diarrhoea, more or less profuse, until death. Pain in the head, left-sided hemiplegia, incessant vomiting, frequent convulsions, coma, and death.

Necropsy.—Kidney, six inches long, eleven inches in transverse circumference, capsule thick, and somewhat adherent, small portions of kidney substance adhering. Interior of organ hollowed out into two large cysts, both of which communicate with the pelvis of the kidney; the larger one, which occupied the lower part of the kidney, was of the size of a large orange; wall one-quarter of an inch thick, and composed of opaque, white material lined with soft granular matter. From appearance the cavity was formed originally by dilated calices. There were four secondary pouches within the large one. The upper cyst was smaller; at the extreme upper end of the kidney was a small remnant of normal kidney structure. The interior of the cyst was ragged and granular and contained a murky yellow fluid of urinous odor, from which a copious deposit subsided after standing in a vessel. It contained pus-cells with granular amorphous matter and triple phosphates. Around the opening of the ureter, which is not dilated, the cavity in the lower end of the kidney is continuous with the pelvis of the upper end, the change in the character of their respective lining membranes taking place by a definite festooned border.

Microscopical Examination: At the upper, most normal-looking portion, the Malpighian tufts are shrinking and some are completely destroyed. Their capsules are thickened by a fibrillated material. Most of the tubes have lost their epithelium, and what remains has its cells rounded and granular and filling the whole calibre of the tube. The stroma between the tubes is most thickened by an indefinite material presenting a slight fibrillation with some granules interspersed through it. There is nowhere any definite cell-growth. The kidney structure lessens as the lower end is approached and is finally lost, there remaining only a granulated and fibrillary substance; in this are embedded numerous small masses of ill-formed, round, and oval cells, which appear to start from the blood-vessels, that have themselves richly nucleated walls. These masses are most marked in the middle of the organ, where there is a broad septum, one inch thick, between the cavities.

Magnan, *Gazette Médicale*, 1867.

CASE IX.—Male, aged thirteen years. Tuberculous abscess of the right kidney with caseous transformation of pelvis, ureter, and bladder. No pain in kidneys. No change in micturition. Urine is albuminous. Anasarca with swelling of the face and œdema of legs. Sibilant and sonorous râles in both lungs. Skin hot, fever intense. Patient died eight days after coming under observation, showing, just before death, violent pain in the hypogastric region which was increased by pressure.

Necropsy.—Miliary granulations at apices of both lungs. Miliary granulations in left kidney. Infiltration of the interstitial structure of the pyramid. A few small, yellowish nuclei in the thickened cortical substance of the hypertrophied left kidney. *Right kidney:* Hypertrophied, bossellated. Perirenal cellular tissue infiltrated with pus in its posterior portion. The ureter is voluminous and thickened. The bladder is normal in size, with thickened wall, and contains two hundred grammes of a suspicious-looking liquid which holds in suspension a few cheesy clots. The shredded pyramids, which are partly destroyed, are located in the midst of a purulent liquid. Some of the pyramids have disappeared, and in their place we find distended caverns, which are full of pus and caseous matter.

Barrier, *Maladies des Enfants*, 1861.

CASE X.—Girl, aged twelve years; on the right side, somewhat above the umbilicus, is a bossellated, hard tumor, size of a hen's egg. It seemed to be located in the mesentery. Died from tuberculosis of the abdominal organs.

Necropsy.—Granulations in the meninges, tubercles in all grades in the intestinal tubes, peritoneum, and spleen, besides tuberculous perforation of the vermiform appendix. The mesenteric glands and the whole urinary apparatus are overrun by tubercles. In the former organs the disease was only slightly advanced. The kidneys, urethra, and bladder were extensively disorganized. The tumor described was due to the increased volume of the right kidney. Both kidney substances were entirely converted into tuberculous matter. The pyramids were entirely composed of tuberculous detritus, and the calices were destroyed. The pelvis and the ureter were entirely infiltrated with tuberculous matter, which seemed to take the place of their walls. In the left kidney the disease was less advanced. The trigone of the bladder and the mouth of the urethra were lined with tuberculous coatings.

Garnier, *Bulletin de la Société d'Anatomie*, June, 1859. Quoted by Gaultier, *Thèse de Paris*, 1882.

CASE XI.—Girl, aged twenty-six months, died at St. Eugénie Hospital within fifteen days of admission, with softening and ulceration of the mucous membrane of the large intestine.

Necropsy.—A dozen semi-transparent, gray granulations upon the apex of the right lung. Left kidney is only injected, larger than normal. The right is almost tripled in volume, bossellated on its surface, and when cut lets two or three spoonfuls of a milky, puriform fluid escape, which contains a few nuclei of tuberculous appearance. It is hollowed internally with large, irregular, sinuous vacuoles, the walls of which are covered with a false, gray membrane which is thickened and adherent to the renal tissue. Around the vacuoles, which mostly communicate among themselves and with the calices and pelvis, we find small tuberculous nuclei of various sizes, from that of a pin's head to that of a pea, of yellowish coloration, and the consistency of the crude tubercle. These deposits overrun the ureter. The ureter is the shape of an indurated cord the size of the little finger. Its vesical orifice will admit a goose-quill. On cutting the walls of the ureter we find, supplanting the destroyed mucous membrane, a gray, granular, and very adherent tuberculous coating. The vesical mucous membrane is healthy, except in one radius of a centimetre around the orifice of the described ureter.

Dufour, *Thèse de Paris*, 1854.

CASE XII.—Boy, aged seven years, had the aspect of a patient with pulmonary phthisis during the evolution of the affection. Had polyuria and polydipsia, which led to a diagnosis of diabetes. These symptoms improved, incontinence developed; eventually, patient died.

Necropsy.—Tubercles of bronchial glands; general infiltration of both lungs; milky blotches on the anterior surfaces of the auricles and ventricles of the heart; a few tuberculous gray granulations in the spleen; right kidney healthy; left kidney strewn with tubercles which were either infiltrated or in the shape of caverns; the mucous membrane of the pelvis and of the calices is also covered with tubercles; it contained urine with a few whitish clots. The dilated ureter contains tubercles located in the thickness of the mucous membrane in such large numbers that the ureter has taken the shape of a tubulous duct with solid and distended walls. The vesical mucous membrane is tuberculous and thickened.

Dufour, *Thèse de Paris*, 1854.

CASE XIII.—Girl, aged fourteen years; incontinence of urine with general cachexia; died of varioloid; tuberculous alterations in lungs, intestines, and liver. The left kidney, ureter, and the bladder showed the same changes as in the preceding case.

Pasquet, *Bulletin de la Société d'Anatomie*, June, 1838. Quoted by Gaultier, *Thèse de Paris*, 1882.

CASE XIV.—Boy, aged twelve years; symptoms of advanced phthisis; no apparent symptoms of the urinary apparatus; death. There was apparent through the abdominal walls to the right and somewhat above the umbilicus a hard, round tumor the size of a small egg, which was taken for a tuberculous tumor of the mesentery.

Necropsy.—Tuberculosis of the brain, meninges, lungs, and intestines, but caseous degeneration was nowhere so far advanced as in the urinary apparatus. The tumor observed in life was formed by the inferior surface of the right kidney, which was bent forward. All the cones of the tubules of this kidney, with the exception of one portion of one, were entirely converted into tuberculous matter with preservation of the normal form, especially at the base of the cones where the tuberculous matter was firm. Towards the calices it was softened and diffuent in some points. Part of the pyramids and all of the membrane of the calices and pelvis were destroyed. The pelvis contained urine in which floated flakes of tuberculous matter. The alteration was less advanced in the cortical substance of this same kidney. In the left kidney two cones only were entirely converted into tuberculous matter, and the cortical substance was but little affected.

Bouchut, "Maladies des Nouveau-nés," eighth edition, p. 698.

CASE XV.—Boy, between five and six years old, under the care of Lannelongue, with indefinite urinary symptoms. Urine very cloudy; intolerable pain on voiding urine. Calculus was suggested. Two soundings resulted negatively. Infant had the symptoms of a purulent cystitis, and a characteristic nephritis, as manifested by the coma and somnolence, alternating with cerebral excitement. Some time after admission rectal examination revealed something the size of an adult prostate on a level with the neck of the bladder. It was soft and almost liquid. Pressure on the anterior wall of the rectum caused pus to exude from the urethral canal, which fact led to the suspicion of a tuberculous affection. Examination of the lungs was negative. Patient died.

Necropsy.—In the final portion of the urethral canal is found a quite considerable cavity, irregularly covered by a yellow detritus resembling tuberculous products. The kidneys are absolutely infiltrated with a caseous material. At the base of the bladder close to a ureter there existed a small body of the volume of a small pea, which proved to be a lymphatic gland. There were six in all at the base of the bladder.

Morrant-Baker, *Transactions of the International Medical Congress*, 1891, vol. ii. p. 262.

CASE XVI.—Girl, aged seven years. First observed October 8, 1880. Had always been delicate. No serious previous illness. Eighteen months before admission to Evelina Hospital, London, she passed a large quantity of blood, partly coagulated, in the urine. One year later had a second less severe attack of hæmaturia. No blood passed since. At the time of the second hemorrhage the urine became puru-

lent, and has remained so. Has been languid, and complained of pain in the chest, with much sweating at night and loss of flesh since two months before the second hemorrhage.

Examination on admission: A rounded swelling, indefinite in outline, found in the region of right kidney, dull on percussion, not very tender, varying in size from time to time. Urine pale; contained much pus, and at times blood, passed frequently in small quantities. Hectic fever very marked. Temperature, 104° F. at night; 97° F. in the morning. Six weeks after admission pus was doubled in quantity, and at this time a half-pint of blood-red urine was passed. Appetite failed. Hectic fever grew more marked.

On December 7, 1880, nephrotomy was done. Improved for a time; grew worse later. Amount of pus increased. February 22, 1881, nephrectomy was performed. *Kidney:* scrofulous, riddled with cavities of various size, lined by thick, whitish, pus-secreting membrane. No healthy structure anywhere, and no stone discovered. Microscopically, the only remnants of healthy structure visible were a few Malpighian corpuscles, and these seem to have undergone fibroid degeneration. The destruction of normal texture seems to be due to extensive cellular infiltration of the whole intertubular connective tissue, which has encroached upon and destroyed the intervening structures. Infiltration is most marked at the surface of the pus-secreting cavities. Many of the blood-vessels are thickened. Marked improvement followed the operation. July 15, 1881, child is about, playing out of doors. Has gained in flesh, color, and strength; eats and sleeps well. Temperature, 98° to 99° F. *Urine:* Quantity of pus, half-ounce in twenty-four hours; getting less. Occasionally a little blood is voided, and usually accompanied by some pain in region of bladder.

Baginsky, *Berliner klinische Wochenschrift*, 1892, p. 516.

CASE XVII.—Child, aged three years. Had osseous and joint tuberculosis; acquired measles. In the convalescence intense albuminuria developed. Pus-cells, fatty and lymphoid tube-casts, and tubercle bacilli in large numbers were found in the urinary sediment. There was a tumor on the left side in the lower posterior region from the edge of the ribs, with dulness over this area. Nephrectomy was done. The kidney contained a cheesy focus the size of a walnut. The capsule and its annexes were intact. The child lived for but a short time. At the autopsy the right kidney was found to be non-tuberculous and the seat of a parenchymatous inflammation.

Charcot and Bouchard, *Traité de Médecine*, Paris, 1893.

CASE XVIII.—Child; died from tuberculosis. One of the kidneys was entirely transformed into caseous masses; the other was normal, showing neither granulation nor ulceration. The spleen and lungs were overrun with tubercles; the renal lesion seemed the oldest.

Max Schede, *Nierenexstirpationen*, Hamburg, 1889.

CASE XIX.—Child, aged three years. Pale, abdomen very large, abdominal veins prominent. A tumor the size of the head of a fœtus in the abdomen in right lumbar region. It is elastic and fluctuating. A yellowish-white liquid containing numerous white globules exuded after an exploratory puncture. The urine is clear and does not contain anything abnormal.

The incision for nephrectomy was made and the cystic pouch discharged eight hundred grammes of liquid like that just described. The finger introduced into the kidney finds in it a very regular pouch in which no trace of kidney substance can be felt. Drainage was accomplished. The result was excellent, notwithstanding the

fact that recovery was delayed by the appearance of a scarlatiniform eruption. Complete excision was accomplished later.

The ureter was slightly dilated in the region of the bladder. Upon the superior and inferior extremities of the cyst are insignificant remnants of renal parenchyma, with reddish-yellow concretions in the urinary canaliculi.

The child died on the 10th of May with whitish deposits on the vocal cords, following a generalized eczema with an intermittent fever, excoriations upon the nose, an aphthous eruption in the mouth, on the tongue, the gums cracked and bleeding, pemphigus upon the hands and feet.

Autopsy.—*Lungs*: Right broncho-pneumonia; right bronchial glands caseous; spleen showed miliary tubercles; peritoneum showed very numerous miliary granulations. Sections of the right kidney showed many tubercle bacilli. Nothing in the left kidney.

Reginald Harrison, "Surgical Diseases of the Urinary Organs," 4th ed., 1893.

CASE XX.—A boy, aged four years. Suspected stone somewhere in the urinary organs. Had many symptoms of this complaint. No calculus had been discovered after several soundings. Strumous family history. Child was singularly bright and intelligent. Twelve months prior to admission he began to wet his bed at night and to suffer from urinary irritability in the daytime. Occasionally, small quantities of blood had been discovered in the urine by microscopic examination. The urine was invariably acid and opaque. Within two months prior to his coming under observation the urine had been charged with mucus and pus, the expulsion of which from his bladder caused great spasm and suffering. To aid micturition and to mitigate the pain, he acquired the habit, which at last became constant, of pulling at his penis. He seemed, as it were, to milk away the urine and what it contained from his bladder.

It was in this condition that the child came under observation. The urine occasionally contained a substance resembling "the white of an egg half-boiled." He was again sounded, under ether, with a negative result. There was an evening rise of temperature with a hectic tendency. A median cystotomy for drainage was performed without benefit. The spasm and vesical tenesmus continued unabated. The child died in a month from the first observation.

Post-mortem.—Bladder and urethra normal. Ureters dilated. The kidneys cystic and tuberculous. Some of the cysts communicated with the pelvis and contained thick, gummy-looking mucus similar to that observed, in a more diluted form, in the urine. The cyst walls seemed to be engaged in secreting this matter. The dilated ureters, the bladder-spasm, and irritability were accounted for in the difficulty experienced in carrying away this viscid matter.

Reginald Harrison, *Ibid.*

CASE XXI.—Boy, aged eleven years. Admitted to the Royal Infirmary, June 19, 1882. About eight weeks previous he passed some pus after micturition. This was repeated occasionally for twelve days. This was followed by the discharge of minute clots of blood at intervals after micturition. On admission the patient micturates frequently with pain referred to head of penis and neck of bladder. A fair, delicate-looking boy. Urine normal in appearance. Specific gravity, 1010, acid; contained mucus and a trace of albumin. June 20, 1882, sounded for stone under ether; nothing detected. By Volkmann's bimanual method of examination of the bladder a nodule was distinctly felt at the fundus. Evening temperature, 102° F., falling in the morning to 97° F. This evening rise continued. The patient was delirious during the night of the 24th, passed into a state of semi-consciousness on

the 26th, and developed strabismus and other symptoms of tuberculous meningitis. *Urine examination on the 27th*: Specific gravity, 1020; albumin one-sixth by bulk. Tubercle bacilli found. Died on the 30th.

Autopsy.—Lungs contained recent miliary tubercles. Liver also contained miliary tubercles, normal in size. Right kidney healthy; its ureter dilated. Left kidney enlarged. On section pelvis and calices dilated and contained a yellow, exudative membrane. This yellow, almost puriform, membrane extended along the whole length of the dilated left ureter to the bladder. There were tubercles in the substance of the kidney, and some of the pyramids were partly absorbed. The bladder mucous membrane was covered with a multitude of minute superficial ulcerations of a tuberculous kind. The mucous membrane of the trigone was roughened, and at the fundus a caseous tuberculous nodule was found. Brain convolutions flattened. Lymph at base. Ventricles very much dilated. Recent miliary tubercles were found in both Sylvian fissures.

Dr. Coats, *Catalogue of the Western Infirmary Museum*. Quoted by Newman in "Lectures on Diseases of Kidney."

CASE XXII.—Boy, aged nine years. A general advanced tuberculosis of the kidney and ureter on the right side, somewhat advanced hydronephrosis with limited tuberculous disease of the kidney, along with dilatation and slight tuberculosis of the ureter on the left side.

The right kidney is enlarged, and consists of a series of cavities with ragged, irregular internal surface and caseous walls. The right ureter is greatly thickened, and lined with irregular caseous material. The mucous membrane of the bladder presents almost continuous superficial ulcerations. The terminal part of the left ureter is greatly thickened and hard; above, it is much dilated and generally thin-walled, with only here and there a localized thickening. The outline of the left kidney is greater than that of the right. Internally, the pelvis and calices are dilated. Their internal surface in the upper two-thirds is smooth; in the lower one-third irregular, sometimes with shaggy projections and a hard caseous lining of some thickness. There is considerable thickness of kidney tissue between the distended calices and the external surface, and in this are seen a number of small abscesses.

Coats believes the primary lesion to have been a local chronic tuberculosis of the right kidney, from which extension down the ureter to the bladder occurred; then through the bladder to the orifice of the left ureter, there creating obstruction with succeeding dilatation of left ureter and kidney.

Bardenheuer's *Mitteilungen*, Fünftes Heft, 1890, p. 23.

Reported as a case of primary renal tuberculosis.

CASE XXIII.—Boy, aged eleven years. Painful swelling of right leg following a fall; three weeks later swelling observed in mid-axillary line, left side, under arch of ribs. Urine clear; no difficulty in voidance; no fever observed; parents healthy. *Status præsens*: Lungs intact; swelling in region of left kidney, which has an elastic touch and which has remained in its original form; operated upon June 7, 1882; complete, left-sided, lumbar extirpation; urine after operation clear, and always free from albumin; child discharged in better health and strength; was living eight years later.

Barthéz and Rilliet, "Maladies des Reins," 3d ed., 1891, vol. iii. p. 1280.

CASE XXIV.—Boy, aged thirteen years. Left kidney small; surface embossed; form, irregularly spheroidal. It was transformed into a dozen cysts, some of which

were filled with a liquid of urinous odor, the others with tuberculous matter in various degrees of softening. One of these, which was more voluminous than all the others, formed more than one-half the kidney. Nowhere could cortical or tubular substance be found. Some of the cavities were in direct communication; others were closed. The ureter was obliterated, and reduced to a solid, fibrinous, non-canalculated cord.

Vidal, *Bulletin de la Société d'Anatomie*, 1854. Quoted by Gaultier, *Thèse de Paris*, 1882.

CASE XXV.—Girl, aged three years. Both kidneys, pelvis, ureters, and the bladder tuberculous; urethra healthy.

Rayer. Quoted by Gaultier, *Thèse de Paris*, 1882.

CASE XXVI.—Girl, aged ten years. Left kidney, calices, and pelvis tuberculous; also ureters and bladder, lungs, liver, and glands.

Gaultier, *Thèse de Paris*, 1882. Case communicated to him by Vaultier.

CASE XXVII.—Boy, aged eight years. No previous illness; sick three months; cough and pain in abdomen. Later, vomiting, cerebral in type; headache, sweats, somnolence, opisthotonos; Cheyne-Stokes breathing; a few râles in the lungs; strabismus, meningitic furrow. Temperature, 38.5° to 39° C. Death.

Necropsy.—Tuberculous meningitis; a few tubercles in the lungs and intestines. *Kidneys*: Right, bossellated, enlarged; surface presents tubercles; on section, about ten cavities, filled with yellowish-white liquid, were demonstrated. The corresponding ureter was infiltrated with caseous matter, which ends at the vesical mucous membrane. Left, contains a large tuberculous focus; the ureter is normal; the trigone and neck of bladder are ulcerated.

N. Baumel, *Montpellier Medical*, 1892, i. 643.

CASE XXVIII.—Boy, aged five years. Father tuberculous; had rickets and Pott's disease. Death was brought about by grippal broncho-pneumonia.

Necropsy.—In addition to the broncho-pneumonia, which was not tuberculous, tuberculosis of the kidneys (unsuspected during life) was found; also the lesions of Pott's disease.

Dr. Thomas Smith, *St. Bartholomew's Hospital Reports*, 1882, vol. viii. p. 95.

CASE XXIX.—Boy, aged four and a half years, admitted to the Children's Hospital, London, February 8, 1868, under Dr. West. Workhouse orphan, farmed out to nurse two months previous to admission, began to pass blood with the urine; on admission had prolapsus ani and severe urinary irritation, passing his water frequently, screaming and shuddering before urination, and being somewhat relieved after. Did not pull his penis; the urine contained pus and red blood; sounded for stone with negative result; was well nourished, though a delicate-looking child, silken hair and large eyes. February 14. Examined under chloroform. A round, firm swelling felt just below the right kidney, size of a large filbert, and thought to be a renal calculus. Bleeding continued with urinary irritation. February 17. Placed his hand to his back and complained of pain which, by degrees, became constant; no severe renal colic. Swelling palpable, painless to pressure, no blood in urine. March 2. Bleeding returned; pain on micturition continued and increased

in frequency. March 13. Small tumor felt either in or below the left kidney; began to pull the foreskin and glans penis, as do cases of stone; pain had increased in severity; was attacked with vomiting, developed convulsions, and died April 2, two months after admission.

Necropsy.—*Kidneys* (right): The mucous membrane of the pelvis and calices was smeared over with tuberculous matter, and was here and there eroded. The glandular texture was in parts invaded by ulceration extending from the cavity of the pelvis. There was a cyst in one part of the kidney containing flaky pus. Here and there in the cortical substance were circumscribed deposits of softening tubercle. The left kidney was in a much less advanced stage of the same disease. In the glandular substance there were a few scattered yellow deposits. The mesenteric glands were enlarged and hard. The liver, spleen, heart, lungs, and brain were normal. *The ureters*: The right was much thickened and shortened; its upper end was much enlarged by a deposit of tuberculous matter in its walls, forming, as was believed, the swelling felt during life. The canal was of normal dimension. The left ureter was greatly dilated, and its walls thinned. Its coats seemed healthy. The dilatation seemed due to the obstruction at its vesical orifice, caused by the condition of the bladder mucous membrane there. *Bladder*: Mucous membrane highly vascular and rough about the orifice of the left ureter. The membrane was villous and blood-stained. There was no deposit visible to the naked eye upon or beneath the mucous membrane.

Dr. Thomas Smith, *St. Bartholomew's Hospital Reports*, 1882, vol. viii. p. 95.

CASE XXX.—Boy, aged fourteen years, under the care of Mr. Warrington Hayward, in St. George's Hospital in March, 1872. Good family history. General health fair, pallid. Occasional hæmaturia for ten months past. Urine thick and voided more frequently than normal. Occasional pain in the bladder for some time past, worse during past three months, occurs both before and after micturition. Never passed any gravel. No lung symptoms. Urine contained a large quantity of pus and granular matter and broken-up epithelium, no blood; it was alkaline and very offensive. Sounded for stone with negative result. March 15. Passed several small clots of blood. During April the hæmaturia was nearly constant, the pain rather less. In May the hæmaturia increased. In June there was very much less blood, but still much pus and granular matter in the urine. The pain decidedly better. Was discharged in July. No further history.

Dr. J. Howship, "Treatise on the Urine," London, 1823, p. 26.

CASE XXXI.—The author refers to case of scrofulous disease of the kidney in boy, without giving any history.

Dr. Cless, of Stuttgart, *Rose's und Wunderlich's Archiv*, vol. iii. p. 4.

CASE XXXII.—Refers to the case of a boy showing the highest degree of tuberculosis of the kidney. He passed a great deal of albumin, but there was no evidence of Bright's disease of the kidney.

R. Atwood Beaver, *Lancet*, 1889, vol. ii. p. 1313.

CASE XXXIII.—Boy, aged three years, presented at the Out-Patient Department of the Lancaster County Asylum. Unable to pass urine. He appeared to suffer pain in the lower part of the abdomen. Examined for stone in bladder with negative result. Three ounces of normal urine were withdrawn. Two days later

child was returned comatose, with contracted pupils and in a dying condition. Bladder was distended, and ten ounces of urine containing blood were withdrawn.

Necropsy.—Cortex and medulla of upper third of right kidney were found to be infiltrated with miliary tubercles, some of which were becoming caseous. No tuberculous matter was found elsewhere in the body after careful search. Bladder was quite healthy. No stone.

Dr. Thomas Smith, *St. Bartholomew's Hospital Reports*, 1882, vol. viii. p. 95.

CASE XXXIV.—Simply refers to the case of a boy, under the care of Mr. Wormald, who was the subject of primary tuberculosis of the kidney.

A. E. Baker, *Lancet*, March, 1888, p. 466.

CASE XXXV.—Girl, aged seven years, with tuberculous pyelitis and sacculaton, with fetid purulent accumulation; right renal tumor, perinephritic abscess, pyuria, pulmonary tuberculosis, nephrectomy. Recovery.

Under John Duncan. Quoted by Newman, "Surgical Diseases of the Kidney," London, 1888, p. 339.

CASE XXXVI.—Boy, aged three years, tuberculous abscess of the kidney, hip-joint disease, nephrotomy. Recovery.

Bardenheuer. Quoted by Newman, *Ibid.*

CASE XXXVII.—Boy, aged three months, nephrectomy and perinephritic abscess, with tuberculous left kidney.

By Golding-Bird. Quoted by Newman, *Ibid.*

CASE XXXVIII.—Boy, aged one and a quarter years, strumous disease of kidney, nephrectomy, and recovery.

Railton, *Reports of the Manchester Pathological Society*, 1891.

CASE XXXIX.—Boy, aged two years and nine months; tumor in left side of abdomen, extending from ribs to iliac crest, and reaching as far forward as one finger's breadth in front of the vertical line of the anterior superior spine of the ilium. Did not move with respiration; dull on percussion. Some slight dulness over apices of both lungs. Child died of tuberculous meningitis. Urine not abnormal.

Necropsy.—Left kidney four to five times its normal size, almost completely transformed into a caseous mass; pelvis and calices were dilated, and contained purulent fluid. Ureter completely closed. Apices of both lungs showed infiltration, caseation, calcification, while that of the right showed, in addition, a small cavity. *Brain:* Considerable quantity of fluid in the ventricles, exuded lymph in the spaces between the optic chiasm and pons and along the Sylvian fissures. Tubercles on the lower surface of the lateral lobes of the cerebellum and in the longitudinal fissure. Railton believed the kidney to be the primary focus of disease.

Dr. H. Bence Jones, *Medical Times and Gazette*, London, 1854, vol. i. p. 615.

CASE XL.—Girl, aged eleven years (supposed scrofulous disease; no autopsy), first observed March, 1850. Pale and delicate. Has had pain in loins four years.

In the summer of 1849 urine contained albumin and sometimes blood. The blood did not appear after exercise. She could jump from any height without causing the appearance of blood. *Urine*: Specific gravity 1010; contained globules and oxalate of lime crystals; acid. Was sounded for stone with negative result, but the examination induced great pain. June 4. Urine contains pus globules, a trace of albumin; no oxalate of lime. February, 1851. Passing much blood. November, 1852. Urine contains blood and pus globules and oxalate of lime. May, 1854. More blood in urine; lungs normal. Thin, delicate-looking, but able to take much exercise without much fatigue. Not anæmic.

Kulakowski, *Przegląd lekarski*, N. 28 Paln, abstracted from *Schmidt's Jahrbücher*, 1881, vol. ii. p. 613.¹

CASE XLI.—Boy, aged nine years. *Symptoms*: great distention and dull percussion in left kidney region. Pressure in the left hypochondrium is painful. Pain in the course of the ureter towards the kidney. There is a swelling of the left half of the scrotum, and upon its under surface is found a small superficial ulcer. Epididymis is hard and painful. Incontinence of urine. Great pain on introduction of the catheter. No apparent calculus. Alkaline reaction of urine and large amount of albumin. Phthisical habit was manifest. There existed a right-sided pulmonary infiltration. Death ensued from tuberculous meningitis.

Necropsy.—Tuberculosis of the urethra, tuberculous ulceration of the bladder, tuberculosis of epididymis, tuberculous basal meningitis, tuberculous infiltration of the apex of the right lung with an accompanying fibrinous pleurisy. Tumor in an extensively diseased spleen.

It was the opinion of the author that the tuberculous process had its primary origin in the kidney in consequence of a preceding nephritis in a subject with hereditary tuberculous tendency.

Baumel, *Virchow und Hirsch's Jahresbericht*, 1892, vol. ii. p. 643. (Abstract.)

CASE XLII.—Boy, aged fourteen years, in whom he suspected tubercle of the kidney. Phthisical family history; anæmic and emaciated. Has irregular slight elevations of temperature. Lungs are quite free. Never has spontaneous pain, but pain in lumbar region upon pressure. Urine shows strong deposit of albumin from day to day. Microscope shows red and white blood-corpuscles. Tubercle bacilli never established.

Steiner, in his "Compendium der Kinderkrankheiten," p. 275.

CASES XLIII. and XLIV.—Refers to having seen two cases of primary tuberculosis of the kidney in children, in both of whom there were scars of old scrofulous conditions on the extremities.

Bruce-Clark, "Surgery of the Kidney," p. 112.

CASE XLV.—Child, seen with Dr. Norman Moore, "Seemed to be a well-marked case of tuberculous kidney. Tumor in left loin for past nine months; urine contained considerable amount of pus. No signs of passage of gravel or of renal calculus. General emaciation and loss of appetite."

¹ Access to the original report of this case was not possible. The abstract of the autopsy does not seem to confirm the clinical history or justify the closing statement.

Bruce-Clark, "Surgery of the Kidney," p. 107.

CASE XLVI.—Patient of Dr. Samuel West; May 20, 1884, aged fourteen years; fair health. Has had fits of abdominal pain and diarrhœa. Present illness of three months' duration; lately several shivering fits. Violent perspiration during sleep; nausea. Vomited twice in last fortnight. He lost a good deal of flesh lately.

Present condition: Emaciated; looks ill. Tongue dry and red. Pulse 120. Swelling on right side of abdomen in region of kidney. Swelling dull on percussion; does not change with position of patient.

Urine: Varies from acid to alkaline in reaction. Copious white deposit which does not clear up with heat and nitric acid. Specific gravity 1025; one-tenth albumin. Pus seen with microscope. Micturition is frequent.

Tumor fluctuates; June 3, aspirated, withdrawing fifteen ounces of greenish, stinking pus. Note of June 12, temperature runs up to 103° F. at night; is normal in the morning. Swelling and pain have increased; considerable pus in the urine; made an incision into the kidney; no stone. Died one month later, pus escaping constantly.

Autopsy.—Tuberculous disease of the right kidney, which was dilated to a mere sac, but little kidney substance remaining. No tuberculous mischief in any other part of the body.

Bardenheuer, *Mitteilungen aus dem Kölner Berger Hospital*, 1890, p. 10.

CASE XLVII.—Boy, aged four years. Without antecedent tuberculous history. Sick for three weeks. In the course of a cold there appeared a tumor in the left lumbar region; painful to the touch. Even slight movement made the infant cry, and especially when he was lifted up by the arms or rubbed. The general condition was sometimes good and sometimes bad. The infant is pale and has a drawn, haggard look. He lies coiled up and screams upon the least touch. In the left lumbar region is a voluminous tumor which is painful, and on this account embarrassing the examiner. Under chloroform the tumor was found to fill the space between the diaphragm and the pelvis on the left side entirely; it was very tender and elastic to the touch; no fever. The urine is cloudy, contains albumin, and, microscopically, blood, pus-corpuscles, caseous masses, and bacilliform micro-organisms.

April 20, 1882. An incision was made into the tumor and an enormous quantity of pus mixed with caseous material exuded. By the combined palpation of the wound and the abdominal wall one finds the kidney pushed forward. A probe penetrates into the renal parenchyma, very likely into an abscess. The kidney was removed. On its surface were found dull, yellow spots; it is very anæmic and friable. In the cortical substance is a caseous cuneiform centre. Recovery followed with the clear urine.

Reginald Harrison, *Lancet*, April 18, 1885.

CASE XLVIII.—A boy upon whom circumcision was performed for elongated prepuce and urinary irritability. Autopsy some time after revealed extensive renal tuberculosis with almost entire atrophy of one kidney.

Duret, *Journal des Sciences Médicales de Lille*, 1894.

CASE XLIX.—Boy, aged eight years. Twice under care for troubles of micturition, which consisted chiefly in pain and incontinence of urine. The symptoms led to suspicion of vesical calculus. Several soundings resulted negatively. The cystitis was treated and the patient went from under treatment improved, several times. He returned again with a voluminous tumor of the lumbar region. An in-

cision was made which caused a discharge of a considerable quantity of pus. The general condition but little improved. Nephrectomy was intended, but the parents removed the child and he was lost sight of.

Carr, *INTERNATIONAL MEDICAL MAGAZINE*, 1893, p. 498.

CASE L.—Child, under twelve years. Both kidneys in an advanced stage of so-called scrofulous degeneration.

Von Muralt, *Correspondenzblatt für Schweizer Aertze*, 1887, p. 242.

CASE LI.—Boy, aged thirteen years. While in good health became suddenly ill with high fever. On the following day developed pain in the right kidney region with hæmaturia. Very large perinephritic abscess developed, which was laid open. There was a discharge of pus through the bladder. Nephrectomy was done; recovery ensued. Tubercle bacilli, after many examinations, were never found.

Von Muralt, *Correspondenzblatt für Schweizer Aertze*, 1884, p. 585.

CASE LII.—Girl, aged ten years, with no hereditary tendency. In the summer of 1880 she had voided thick, muddy urine, but not after that until the spring of 1882. There developed, with pain and fever, a large swelling in the region of the right kidney. The patient applied to the Children's Hospital on July 14, and the perinephritic abscess, which constituted the swelling, was emptied by a broad incision in the lumbar region at a point where perforation threatened (twelve hundred and fifty cubic centimetres of pus, no kidney substance, but tuberculous matter; extirpation would not then be permitted). This resulted in immediate fall in temperature, improved general condition, increase in weight, and by November 8 patient in good condition, with little discharge of pus. Was better for three months. Reappeared at the hospital on January 31, 1883, with high fever. March 24 operation was granted. A partly cystic, degenerated, tuberculous kidney with enormously thickened capsule was removed. Great improvement for four weeks, when perforation of the duodenum occurred and patient died.

Necropsy.—Perforation of the duodenum by a sinus into the abscess cavity. Tuberculosis of right ureter and bladder. Left kidney and ureter healthy. Two old scars in left lung, and an old, cheesy, calcareous bronchial gland.

Kummell, *Deutsche Medicinische Wochenschrift*, 1890, p. 1000.

CASE LIII.—Child, aged two and a half years. Had frequent painful micturition, and pain in the region of the bladder. The urine contained albumin and abundant sediment without real elementary ingredients. Examination under narcosis. Enlargement of one kidney which, with rapid progressive emaciation, led to diagnosis of tuberculosis of the kidney. Nephrectomy was done and recovery ensued.

König, *Verhandlungen der deutschen Gesellschaft für Chirurgie*, 1890, p. 70.

CASE LIV.—A young maiden. Very well nourished. Complained of hæmaturia. Examination of the bladder showed it healthy. Tuberculosis of the kidney was suggested, because one kidney was decidedly large and painful, and so soon as it was pressed upon the bleeding increased quite enormously. The tumor was quite apparent, and the condition was thought to be unilateral. Excision was done.

The whole kidney was transformed into a number of large caseous foci, but little kidney substance existing. The pelvis and ureter were greatly dilated, and stuffed full of cheesy masses. The bleeding continued, and it was pretty definitely deter-

mined that the other kidney was diseased, and that it was the source of the bleeding. König thought the operation had done no good, but surely no harm.

Schmid, *Münchener Medicinische Wochenschrift*, 1892, p. 255.

CASE LV.—Boy, aged twelve years. Previous health good. Since five months has had irregularity in urination,—pain and incontinence. The urine was ammoniacal; contained much pus. There was no stone or tumor revealed in the examination of the bladder, and no tumor in the kidney region. Despite local and general treatment the patient's condition grew worse. Light, fluctuating fever developed. In December, 1890, a perineal section was done. The finger introduced into the bladder revealed incrustation and proliferation upon the mucous membrane of the bladder, which was scraped off. Temporary improvement followed. The bladder was scraped off several times after, but the incontinence remained quite the same. The condition grew worse, and the patient was nearly always bed-fast. On May 10, 1891, a tumor was discovered in the right kidney region, which could be described as a pyonephrosis. On May 20, nephrotomy by the lumbar incision was done. After incision of the pelvis pus escaped in large quantity, but no stone. No improvement followed. Moderate amount of albumin was present in the urine, and the fever continued. A diagnosis of tuberculosis of the right kidney was made. Whether it developed as a primary tuberculous cystitis with secondary involvement of the right kidney, or whether the tuberculosis first laid hold of the right kidney and had caused no symptoms there, and, dependent upon it, a tuberculous cystitis had developed, must remain undecided. Notwithstanding the poor prospect and miserable condition of the boy, the dilated kidney was extirpated, and the stump brought into the wound. But the vessel was so short that after tying and securing it by suture for safety three clamps were left lying in the wound. The peritoneum was not opened. The boy recovered quickly; the fever vanished; the urine was copious and finally quite clear and free from albumin; only the incontinence lasted. Dismissed in December, and in March of 1892 continued well. Examination of the resected kidney showed that fatty degeneration existed, and that in several spots distinct tuberculous foci existed.

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CHRONIC HERPES OF THE FAUCES.

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As "chronic herpes of the fauces" it is here meant to designate a chronic vesicular affection of rare, yet typical occurrence, which invades the region of the fauces and soft palate as a distinct and apparently independent disease, having its own characteristic course which, when followed out, suffices to distinguish it from certain other affections of the throat from which it is, at times, of the utmost importance to differentiate it. Herpes, being essentially an acute affection, invades the region of the fauces oftenest in an acute form, although an erroneous impression as to its frequency has undoubtedly been conveyed by confusing it with other affections. Bretonneau was probably the first to maintain that a common form of sore throat, which he called "common fibrinous angina," characterized by the exudation of fibrinous material and the formation of false membrane, was

nothing other than a progressive development of an herpetic eruption, the vesicles of which, owing to their ephemeral existence, were rarely seen. Bretonneau's observation was confirmed by Trousseau,¹ and further demonstrated by Grubler. Grubler,² however, looked upon the herpes as a kind of eruption in the throat which constituted, as it were, the crisis of a fever. Following these observations and the report of several epidemics of sore throat characterized by an herpetic eruption, non-diphtheritic exudative inflammations in general were frequently referred to in the literature as "herpetic tonsillitis," and this has, unfortunately, resulted in no little confusion; so that we find in the literature of to-day even typical cases of follicular tonsillitis classed as herpes. At the present time the view is advanced, and has many advocates, that aphthous stomatitis is identical with herpes. Thus we are confronted with the proposition that common membranous sore throat, characterized by tumefaction of the tonsil and the formation upon its surface and adjunct tissue of yellowish-gray patches which tend to become confluent, and aphthous stomatitis, with its widely-sown, scattered, punctate eruption, its excessive salivation, are one and the same affection. It is to be borne in mind that, aside from the herpes which may develop during general pyrexial diseases, such as pneumonia, rheumatism, etc., herpes may occur as part of, and apparently called forth by, infectious or other inflammatory diseases of the throat, in contradistinction to that form of herpes which is in the nature of a zoster,—that is to say, apparently due to irritation of the nerves or nerve-centres from some unknown cause. Now, herpes does occur on the mucous membrane of the throat in a form which is characteristic of herpes of other parts,—namely, as an independent eruption of more or less clustered vesicles, apparently of nervous origin, and this may be beautifully verified in that form of the disease to be considered.

Chronic herpes of the pharynx is rarely met with, and the literature upon the subject is extremely scant, yet when it does occur the repetition of the vesicular eruption renders its detection more certain, and the progress of the affection to its later stages may be so closely followed as to establish beyond a doubt the independent occurrence of the affection in this region. The first manifestation of herpes in the mucous membrane, as upon the cutaneous surface, is the appearance of minute papules upon an erythematous patch; this is followed by fluid exudation, which accumulates at the level of the granular layer of the epidermis, and the papules are thus rapidly replaced by vesicles. As pointed out by Hebra,³ however, the future progress of the affection is materially modified by the nature of the tissue attacked. "On the cutaneous surface the eruption consists of vesicles distended with a clear watery fluid, which are arranged in clusters and which remain intact for a considerable time. In the mucosa, on the other hand, the formation of vesicles does not go beyond its earliest stage." Owing to the delicate nature of the epithelium the vesicles are rapidly ruptured, and we, therefore, usually see on first inspection a number of white spots, perhaps as

large as lentils, which are due to the maceration of the epithelium, and where this has become detached, we further see circumscribed, shallow excoriations which correspond to the destroyed vesicles. When we add to this the fact that these erosions, before healing, usually become covered with fibrinous exudation, we have the characteristic features of an acute attack of herpes of the mucous membrane.

Now, chronic herpes is characterized not only by a protraction of the above process and the tendency to the formation of a denser sheet of membrane by the extension of the smaller isolated patches of exudation upon the inflamed area, but repeated exacerbations may be seen to occur at points previously uninvolved. Fresh crops of vesicles develop at various times which, as in the case of the acute attacks, may rapidly cicatrize after rupture, or possibly even undergo rapid absorption without rupture, but which usually give rise to new erosions and fibrinous deposit upon a new area of inflammation, so that by frequent observation we may not only see the disappearance of the process at one place and its sudden development at a new one, but at times also see the vesicles themselves and observe the field which they occupied become converted into small, isolated, filmy patches, and later merge into dense, confluent sheets of membrane which cannot be distinguished from the pseudo-membrane of diphtheria.

As illustrative of these facts, the two cases submitted below, which the writer was fortunate enough to have under close observation, are given somewhat in detail.

CASE I.—Miss N. W., aged twenty-four, evidently of neurotic temperament, had been attacked three years ago, while in Europe, with a painful affection of the throat, accompanied by some fever, during the course of which white patches formed in her throat, which soon loosened, so that they appeared as flakes or shreds upon her tongue. The condition would improve and then get worse again,—that is, more patches would form, till after some three or four months it disappeared altogether. Upon her arrival in this country, a year later, the affection broke out again, accompanied by an aching pain in the throat, and it was at that time pronounced diphtheria. It lasted, as upon the former occasion, several months, varying in its severity, to finally disappear entirely. As the condition had again developed, she came to consult about it. At first inspection of the pharynx there was to be seen upon the side of the uvula an irregular membranous patch about as large as a three-cent piece; upon the anterior and posterior pillars of the right fauces several smaller, grayish-white patches, two of which were confluent; the smaller patches being for the most part mere films; that upon the uvula thick, opaque, and membranous in appearance. Within the inflamed area occupied by the smaller patches a number of circumscribed, denuded spots were to be seen; beyond the patches the tissue remained normal in appearance, and at this time the tonsil was not involved.

Within a week from the day they were first seen the patches had become confluent, so that one large triangular sheet of membrane extended from the uvula to and over the left tonsil. At places this membrane appeared loosened, and at the tip of the uvula was folded back upon itself in the form of a flap. Upon attempting to remove it with a forceps, however, it proved to be quite firmly adherent, and the denuded surfaces bled where it had been detached. Several flakes of the membrane were sent on two different occasions to expert bacteriologists at the City Hospital,

who found, beyond the presence of the staphylococcus pyogenes, nothing which indicated the nature of the affection which gave rise to it. After a lapse of three weeks the condition had almost entirely disappeared under treatment, when an exacerbation occurred upon the opposite side of the throat, marked by pain, inflammation, and the appearance of a number of scattered white spots, and the patient then first informed me that she sometimes felt blisters in the back of the mouth, which were easily broken. With this new light upon the case I established a close watch, and instructed her to come to me at once when she thought that blisters were present, and by this means I was enabled, during a period of several months, to detect upon two distinct occasions the presence of vesicles or blebs upon the affected mucous membrane. At one time there were two tense, glistening blebs upon the side of the uvula, one of them the size of a split pea; at another time there was a cluster of six or more opaque vesicles at a point previously uninvolved, all of which remained upon the mucous membrane but a few hours. Following the rupture of the vesicles, isolated, filmy patches soon occupied the field of the eruption, which, when left to themselves, speedily became confluent. This patient was exhibited at the meeting of the Ohio State Medical Society, the disease having been allowed to run its course unchecked for several weeks previous. At that time the uvula, the pillars of the fauces, and both tonsils were completely covered with a dense, grayish-white membrane; in places closely adherent, in others loosely attached, so that it formed parallel folds across its surface, or even hung in shreds. Neither then nor at any time while under observation did it invade the posterior pharyngeal wall. Although it yielded temporarily to a varied treatment, so that the membranous deposit for the time being entirely disappeared, the affection was frequently lighted up again during a period of thirteen months. It finally faded away entirely, and has not recurred in the past two years.

CASE II.—J. R., aged twenty-two, presented himself with a severe aching of the throat, accompanied by heat, dryness, and difficulty in swallowing. For several years past he has had similar attacks which had twice developed into membranous diphtheria, and he believed that he was about to suffer from a recurrence of that disease. Temperature, 101° F. Upon illuminating the throat two distinct fields of inflammation were noticeable, the one covering the region of the uvula, the other upon the lower part of the arch of the right anterior pillar. Upon each of these a number of round or oval white spots were scattered. At the base of the pillar, interspersed among the spots referred to, eight or ten yellowish, semi-opaque vesicles of the size of a millet-seed were plainly visible, several of which were ruptured by puncture. Upon inspecting the pharynx on the following day, nothing resembling a vesicle was seen. During the ensuing week small, irregular, filmy patches made their appearance in the region attacked, which, however, were held in check by applications of nitrate of silver, and, the soreness having left the throat, the patient ceased coming. Several weeks later he again appeared with a renewal of the painful symptoms. The picture of the affection at this time had undergone a complete change, the region of the uvula was normal in appearance, and upon the left side of the pharynx and the left tonsil a number of irregular membranous patches were to be seen. These proved more persistent than upon the former occasion, and would heal and become detached at one point only to develop at another; but as the pain and irritation passed away the patient, who lived out of the city, ceased coming, so that it was, unfortunately, not possible to follow the further course of the disease.

In view of the slight and transient nature of the general symptoms which ushered in the protracted local affection, the idiopathic nature of these cases is hardly to be questioned.

While the limited extent of the lesions does not justify their classification as a zoster, the neurotic nature of the eruption was strongly indicated. In both cases the vesicles were distinctly clustered, and the eruptions confined to limited areas, usually in several places on the same side, which, however, extended at times beyond the median line, and which disappeared in one region only to attack another. A limitation of herpes in any form by the median line within the pharynx is, in the light of existing knowledge, hardly to be expected, since it has been shown by the most painstaking and thorough investigation of Voigt, during which he succeeded in laying bare nearly all the cutaneous nerves quite to their peripheral extremities, that in the middle line of the body, as well as in other regions, the end filaments of the cutaneous nerves encroach upon the neighboring nerve territories in such a way that strict boundaries or entirely neutral zones hardly exist at all.

That herpes can be caused by irritation or disease of nerves or nerve centres is not only positively established by the well-known researches in cases of herpes zoster, by Bärensprung, Mackenzie,⁴ of New York, and others, but is also indicated by repeated instances in which it has been called forth by peripheral irritation, as, for example, in the cases following operations upon the teeth, reported by Dr. T. David,⁵ of Paris. Kaposi, from his investigations, has concluded that the disease is not always associated with inflammation of the ganglia, but that it may arise in the nerve often as its peripheral distribution.

Herpes, then, occurs in the pharynx as a chronic affection in a typical form; it is probably neurotic in character.

In chronic herpes the vesicular eruption may be more frequently observed than in the acute affection, and the progress of the disease more accurately followed.

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OBSERVATIONS ON ANTITOXIN IN DIPHTHERIA.¹

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IN writing these papers I have proposed to limit myself, in the main, to simply presenting and arranging the clinical data furnished by the hospital records, from which every one may draw his own conclusions. In observing a large number of cases of a single disease, all subject to the same method of treatment, one usually forms a more or less decided opinion or, at least, impression of the value of that treatment. In the present instance, however, I must admit that I am as yet unable to range myself either among the enthusiastic advocates of diphtheria antitoxin or with those who unqualifiedly condemn it. Perhaps if I touch upon some of the clinical features of diphtheria as modified by the administration of antitoxin in the Willard Parker Hospital, the reasons for my position may become apparent.

Among the favorable results claimed to follow upon the injection of antitoxic serum are a prompt improvement in the general condition of the patient, a strengthening of the action of the heart, a fall of the temperature, a rapid disappearance or "melting away" of the membrane in the throat, and marked relief of laryngeal stenosis. I have already said that I believed that antitoxin often had a favorable effect upon the laryngeal symptoms, and I am inclined to think that this is especially true of the intubated cases, which seem to do better under antitoxin than without it. On the other hand, I have failed to note any effect, favorable or otherwise, upon either the pulse or the temperature, nor have I ever seen any "melting away" of the membrane which is not also observed in cases which have not received antitoxin. There is a case now in the wards in which the membrane has persisted for three weeks, although antitoxin was given on the third day of the disease. The general condition has also usually remained unaffected, except as it might be influenced by the relief of laryngeal stenosis referred to above.

Now as to the alleged untoward effects of antitoxin. It has been said to cause nephritis, or, at least, albuminuria, to favor post-diphtheritic paralysis, to dissolve the red cells of the blood, and to set up septicæmia in some manner as yet unexplained. In regard to all these clinical phenomena, I can only say that I have failed to observe them, though I have looked for them day by day, particularly during the past eight months.

¹Supplementary to a paper on "Observations on Antitoxin in Diphtheria," appearing in December issue of the INTERNATIONAL MEDICAL MAGAZINE.

Cases have shown albuminuria as in previous years, and, in the opinion of one of the resident staff, rather more often than formerly, but casts or other evidence of nephritis have been absent. Suppression of the urine occurs, but not with unusual frequency. With the exception of simple regurgitation, due to temporary paresis of the palatal muscles, I should say that post-diphtheritic paralysis has been noteworthy by its absence during the present year. With regard to the destruction of the red cells of the blood, or the occurrence of septicæmia, I have seen nothing which would lead me to attribute either of these morbid processes to the administration of antitoxin rather than to the diphtheritic poison itself. Among the hundreds of cases treated this year in the hospital there is but one in which, in my opinion, antitoxin may have contributed to the fatal termination. In the case in question, a severe one at the outset, a synovial inflammation developed in several joints some ten days after the injection of serum, coincident with an urticarial eruption covering the legs and trunk. The fluid in the joints became purulent and the signs of broncho-pneumonia were found in the lungs. After a protracted illness the child died, and on autopsy, in addition to the pus in the joints and the pulmonary consolidation, there was marked fatty degeneration of the heart and kidneys. This case would probably have died from the other complications, but we cannot but associate the joint process with the giving of the antitoxin.

REVIEW OF MEDICINE.

MEDICINE.

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Fever in the Course of Bright's Disease and in Uræmia. (*American Journal of the Medical Sciences*, November, 1895.) By Alfred Stengel, M.D., of Philadelphia.

Fever may occur in the course of Bright's disease under three conditions: first, at the onset of acute nephritis as a result of the infection or intoxication causing the disease, or of the inflammatory or degenerative lesions in the kidney itself; second; in the course of acute or chronic Bright's disease as a result of various complications; and, third, in uræmia. The fever associated with uræmia may be sudden and pronounced, and

associated with coma, delirium, or convulsions,—eclamptic fever; or it may be more general, more lasting, less marked, and associated with typhoid symptoms,—slow uræmic fever.

A Case of Anthrax Septicæmia in a Human Being associated with Acute Anthrax Endocarditis and Peritonitis. (*Bulletin of the Johns Hopkins Hospital*, September to October, 1895.) By George Blumer, M.D., of Baltimore.

This case presents the œdematous form of anthrax which is very rare in this country. It is probable that the infection took this form because of its location about the eyelid, in which region the skin is very thin and the cellular tissue loose in character. The patient, a man, aged fifty-nine years, became infected on May 9, 1895, by scratching his eye while working on South American hair. Two days later he was admitted to the hospital with an œdema which closed both eyes. Several vesicles appeared on the tense, overlying skin of the lids of the right eye, and a marked œdema extended over the forehead to the left side and down the face and neck to the clavicles. The glands of the neck were moderately enlarged and tender. On May 14, sharp, constant, cramp-like pains were felt in the umbilical region, and the abdomen was extremely sensitive to pressure; the pulse was almost imperceptible; the temperature subnormal. The patient died on the same day.

Autopsy.—The points of greatest interest are œdema, which was greatest on the right side, extended over the entire head, face, neck, and clavicles, and down onto the chest. The epidermis was peeling on the right side of the face and contained much serum-like fluid. The peritoneal cavity contained at least two thousand cubic centimetres of fluid, and large and small ecchymoses were found on the serous membrane. The mediastinal tissues were swollen, œdematous, and contained gas bubbles. Both lungs were emphysematous and œdematous and nearly covered the heart. The pericardium contained gas; the heart muscle was friable and pale; small, quite recent vegetations covered by small, red clots were found along the free edge of the mitral valve and along the aortic segment. The liver was dark in color and cloudy; the spleen was moderately soft and red in color; the kidneys were swollen and congested; the adrenals and pancreas were normal, the stomach showed a deeply congested area in the pyloric region; the duodenum was uniformly congested, jejunum and ileum less so, but at intervals were small, elevated, deeply congested or hemorrhagic foci which projected above the surface of the intestine and did not seem to correspond to the lymphatic follicles. The serosa over them was hyperæmic or hemorrhagic and bulged out. Several of the nodules showed superficial ulceration. The mesenteric glands were hemorrhagic and softened. The large intestine showed congestion, but no foci.

Bacteriological Examination.—Cover-slips and cultures made during life from the serous fluid and blood showed large bacilli, morphologically

resembling the bacillus anthracis. Cultures made from the different organs after death gave the bacillus anthracis alone. Mice inoculated with this culture died in twenty-four hours.

Histological Examination.—The vegetation on the heart valve consisted mostly of fibrin with some granular matter, red blood-corpuscles, polynuclear leucocytes, with anthrax bacilli. The bacilli were more numerous in the blood-vessels of the lungs than in any other organ. A moderate degree of chronic interstitial pneumonia was found. The liver showed a well-marked interlobular cirrhosis with bacilli in the blood-vessels between the cells. The kidney showed a localized connective-tissue formation. Anthrax bacilli were present in the slight exudate covering the surface of the kidney, but were most abundant in the Malpighian corpuscles. Beneath a necrotic area in the stomach were two ruptured blood-vessels from which spreading masses of bacilli extended to the mucous membrane. Anthrax bacilli were found in all portions of the intestinal wall, but in greatest numbers in the submucosa. The blood-vessels were intensely dilated, with rupture of the vessel wall in some places. Necrotic areas were frequent on the surface of the intestinal wall.

Endocarditis and Intermittent Fever. (*Boston Medical and Surgical Journal*, November 7, 1895.) By George Dock, M.D., of Ann Arbor, Michigan.

The following cases emphasize the importance of careful diagnosis and prognosis in those obscure forms of endocarditis which simulate malarial fever. In the first case a malignant endocarditis affecting the mitral valve and the left auricle developed *post partum*. Mrs. N., aged twenty-six years, was confined January 16, 1895. The child was delivered with forceps, and a slight laceration of the perineum was immediately repaired. Slow recovery for three weeks was followed by weakness, chills, fever, and sweating. The patient was treated for malaria without effect, then examined for symptoms of sepsis with a negative result. The writer then saw the case and diagnosed malignant endocarditis due to puerperal infection, probably assisted by an old symptomless lesion of the mitral. A loud grating systolic murmur, louder over the apex, was heard all over the thorax, in the axilla, and over the back; a second, soft, systolic murmur was heard along the edge of the sternum. The temperature record showed remission or even a continued type at first, then a pure intermittent fever. The patient died April 13. The autopsy confirmed the diagnosis. Masses of vegetations were found on the mitral and aortic valves and over the endocardium. Large numbers of streptococci were seen on microscopical examination. The second patient gave a history of chronic cystitis, and had suffered for some months with chills, fever, and sweating at irregular intervals, and was pale, weak, and emaciated. Malaria was suspected, but a blood-examination proved negative. An examination of the heart showed an enlarged area of cardiac dulness, a rough systolic murmur confined to the region of

the apex, and another systolic, high-pitched murmur, transmitted in all directions but heard loudest over the apex. Later, a chill, vomiting, and prostration, with pain in the left side over the much-enlarged spleen, was thought to be due to an infarct. An examination of the urine showed an excess of leucocytes and large numbers of streptococci. Improvement and normal temperature were suddenly followed by death. The autopsy showed œdema of the lungs, dilatation and hypertrophy of the heart, thickening of the aortic leaflets, and streptococcus vegetations on the mitral. The spleen was adherent to the liver and contained five infarcts. Three old infarcts were found in the left kidney. The bladder walls were thickened, and the mucous surface dotted with pus. Infection from the bladder was engrafted upon an old lesion of the valves. The third case had a history of heart-disease fifteen years before. He was treated for malaria, but gradually grew weaker and died rather suddenly with asphyctic symptoms. Vegetations containing masses of streptococci were found on the valves, but the mode of infection could not be discovered.

Chills in Typhoid Fever. (*University Medical Magazine*, November, 1895.) By William Osler, M.D., of Baltimore.

Chills may occur in connection with typhoid fever,—first, at the onset of the disease, as seen in thirteen cases out of a total of seventy-nine treated at the Johns Hopkins Hospital during the sixth year. Second, at the onset of the relapse, due to an irregular or a disturbed elimination of the poison, a large volume of which is thrown into the blood in a short time. Third, as a result of treatment, antipyretics being particularly prone to produce chill, and this phenomenon may occur after the injection of sterile cultures of bacilli and after the external application of guaiacol. Fourth, with the onset of complications, such as pneumonia, pleurisy, acute otitis, suppuration in the mesenteric veins, pyæmic abscesses of the kidney, perforation of the ileum or appendix, or an acute periostitis. It may occur with thrombosis of the femoral or saphenous veins, and it may precede acute and fatal hyperpyrexia. Fifth, during convalescence in severe and protracted cases. In such cases there may be no local symptoms to account for the chills, and, though alarming, they may gradually subside, with complete recovery. They may possibly be septic. Sixth, chills may be due to concurrent malaria. While attributed, as a rule, to malaria, chills in the course of typhoid fever are very rarely due to this cause. Among three hundred and thirty-three cases of malaria and three hundred and eighty-nine cases of typhoid fever treated at the Johns Hopkins Hospital, in no instance have the diseases been concurrent.

Tetanus Consecutive to a Bite of the Tongue in an Eclamptic. (*Revue des Maladies des Femmes*, October 25, 1895.) By M. Abelin, of Bordeaux.

The author reports the following case: An eclamptic woman presenting

a deeply-bitten wound of the tongue was brought to the Maternity at Rochefort. The attacks diminished under injections of chloral, and disappeared altogether after delivery, which was hastened by the application of forceps. The patient appeared to be cured, when, eight days after confinement, she began having attacks of tetanus and died in forty-eight hours.

It is probable that the wound of the tongue had been contaminated by the dust on the floor of the vehicle in which she was conveyed to the hospital. That the point of entrance of the germ had been the tongue, and not the uterine wound, was proved by the fact that the first attack of tetanus was preceded by violent pain in the tongue.

The Practical Value of Laveran's Discoveries. (*Medical News*, November 23, 1895.) By William Osler, M.D., of Baltimore.

There are several aspects in which Laveran's studies may be considered of immense value :

The Relation of the Protozoon to the Acute Infections.—As a direct outcome of the study of the protozoal parasites of paludism may be mentioned the brilliant discovery, by Theobald Smith, of the parasite of Texas fever, also a hæmatozoon connected in its life-history with the cattle tick (*Boophilus bovis*). Observations have also been made upon amœbic dysentery and certain skin-affections, and the question of the protozoal origin of carcinoma has been revived.

The Diagnosis of Malarial Fever.—Laveran's work has revolutionized the study of fevers. The parasites are now known to be present in all forms of malaria, and constitute a diagnostic criterion of unfailing accuracy in uncinchonized subjects. It is in the study of the fevers of the tropics, however, that his discovery will prove of the greatest service, and, as shown by the work of Vandyke Carter, in India, and Dock, in Galveston, the differentiation of malaria from other fevers is quickly made. The publication by the New Sydenham Society of Laveran's monograph, the works of Marchiafava and Bignami, of Mannaberg, and the monograph of Thayer and Hewitson, containing the most extensive and complete bibliography yet published, give access to all the available literature on this subject, and should prove a great stimulus to the study of tropical fevers from the new stand-point.

Malaria has often been diagnosticated in cases in which chills and fever were due to other diseases, simply because the patient has had recurrent chills. Perhaps the most frequent mistake is in the chills and fever of tuberculosis. Septicæmia, abscess of the liver, pyelitis, pyelonephritis, gall-stones, and empyema are overlooked in the same way. The profession at large has not yet laid to heart the following rules: 1. That the diagnosis of the malarial fevers can be made with certainty by the blood-examination. 2. That an intermittent fever which resists quinine is not of malarial origin.

Malaria and Vital Statistics.—In the United States Census Report for

1890, which covers the six years ending May 31, the deaths from malarial fever in Baltimore, New York, and Brooklyn exceeded those from typhoid. The writer has compared this report with those of the large hospitals of New York and Brooklyn, and with tables prepared under the direction of the Committee of Health in the last-named city, and has come to the conclusion that the mortuary bills dealing with malaria are false, due either to ignorance or to wilful deception on the part of those who made the returns. Malaria is a disease that rarely kills in the large towns on the Atlantic seaboard, and it behooves the profession to abandon the practice of making a careless diagnosis of the disease in every case of obscure fever which proves fatal, and the medical boards should refuse to receive a death certificate signed malarial fever without more specific details than have heretofore been demanded.

THERAPEUTICS.

IN CHARGE OF ALEXANDER D. BLACKADER, B.A., M.D.,

Professor of Therapeutics, McGill University, Montreal, Canada,

ASSISTED BY

D. J. EVANS, M.D.

The Confessions of a Cocainist. (*Australasian Medical Gazette*, September 20, 1895.) By J. W. Springthorpe, M.D.

The devotee, a medical man of great mental endowments, first used cocaine when serving in the German army. He gave up the drug for four years, but then witnessed its wonderful effects upon a colleague, and could not resist the temptation to begin using it again. He says that within a month he was using from eighty to one hundred and twenty grains of cocaine daily. His largest single dose was twenty grains, which caused him to fall down suddenly and to remain in a cataleptic condition for some hours. He describes the sensations of a cocainist as, first, an indescribable excitement, with the thought of doing something great; then the hearing becomes enormously increased, and soon every sound seems to be an unpleasant remark about one's self; bugs and worms are felt, and even seen, upon the person and clothing, and later many frightful hallucinations, all of a persecuting character, are present.

He summarizes the physiological effects of the drug as follows: The cocainist early loses all appetite for solid food, but likes sweets. Diarrhoea is soon produced and immediate evacuation often follows large injections of the medicine. The drug is a powerful stimulant to the muscular system; it increases the number of respiratory and cardiac contractions; it increases the amount of urine, and enormously increases the amount of sweat; it stimulates the sexual appetite; the pupils are dilated after each injection. Mental processes seem quickened, but a kind of hypnosis intervenes so that the brain works without, and even against, the will. Hallu-

cinations and illusions make their appearance early. The sense of right and wrong is not abolished, but one does not care much about trifles, and in time may become a scoundrel or a criminal.

The cocaine habit is distinguished from others by the change of associations of the person, his neglected appearance, his dilated pupil, restlessness, hallucinations, illusions, and expression of anguish.

Etiology and Treatment of Certain Kinds of Cough. (*American Journal of the Medical Sciences*, November, 1895.) By Beverley Robinson, M.D., of New York.

Cough may be due to an engorgement of the lingual tonsil, and is then accompanied by the sensation of a foreign body lodged at the base of the tongue and by a desire to swallow constantly, with the feeling of a constricting band around the throat. These cases occur most frequently in middle-aged women, and are due to menstrual derangements, continued constipation, and an underlying rheumatic or gouty state. They may be due to micro-organismal affection or to syphilis. This variety of cough should be treated by the internal administration of the salicylates combined with local treatment by the galvano-cautery or the compound tincture of iodine. The last-mentioned solution is very efficacious.

A form of cough occurring in young children is due to the dropping of thick mucus or muco-pus from the naso-pharynx upon or into the larynx, or by an irritation of the posterior turbinated bodies brought on by local congestion. It may be due to an enlargement of the pharyngeal tonsil. The latter condition is to be treated by scraping with the finger-nail. If, after the scraping, there be much hemorrhage, Mackenzie's tanno-gallic powder may be used or the post-nasal space may be plugged. Where there is no enlargement of the pharyngeal tonsil a nasal spray of camphor, carbolic acid, and albolene, or applications of carbolic acid and glycerin to the nose should be used. It is important to avoid overloading the child's stomach at night. Hypersensitive areas in the pharynx, in the tonsillar region, upon the soft palate, in the hyoid or epiglottidean fossa may cause a cough. Of the internal remedies used for these conditions, codeine and terpin hydrate are the most beneficial. The causes of these sensitive areas are not always satisfactorily demonstrable. Paroxysmal cough may be due to irritation in the auditory canal, such as impacted cerumen; there are other instances in which the cough is due to impairment of the auditory function. In these cases the auditory condition should be treated in order to remove the cough, and if there is a lithæmic tendency that should be combated.

In some cases of chronic cough the most benefit will be derived from a change of air and scene; in other cases salicylate of sodium or the salts of lithium should be used; in still other cases quinine and arsenic or cinchona bark may effect a cure. In many instances of cough of various kinds great temporary relief may be obtained from dry vapor inhalations of dif-

ferent volatile fluids. The best combination of this kind consists of equal parts of camphor, menthol, and eucalyptus. In cases of cough arising from severe bronchial inflammation or in those from broncho-pneumonia inhalations of beechwood creosote mixed with steam are valuable as relieving the cough and in curing the disease. Cough due to inflammation of the pleura should be treated by blisters.

Schleich's Method of Local Anæsthesia. (*Medicine*, November, 1895.) By Louis A. Greensfelder, M.D., of Chicago.

The following are the formulæ for the solutions used by Schleich for producing local anæsthesia.

No. 1, Strong.

R Cocainæ hydrochloratis	0.200
Morphinæ hydrochloratis	0.025
Sodii chloridi (sterilized)	0.200
Aquæ destillatæ (sterilized), q. s. ad 100.000.—M.	

No. 2, Normal.

R Cocainæ hydrochloratis	0.100
Morphinæ hydrochloratis	0.025
Sodii chloridi (sterilized)	0.200
Aquæ destillatæ (sterilized), q. s. ad 100.000.—M.	

No. 3, Weak.

R Cocainæ hydrochloratis	0.010
Morphinæ hydrochloratis	0.005
Sodii chloridi (sterilized)	0.200
Aquæ destillatæ (sterilized), q. s. ad 100.000.—M.	

One drop of a forty per cent. solution of formalin should be added to each of these solutions to preserve them. The fluid is injected and the part to be operated upon is surrounded by wheals of the injected fluid. These wheals may be carried into the deep tissues. The area for the primary needle puncture may be anæsthetized by a drop of ninety-five per cent. solution of carbolic acid.

The Treatment of Pneumonia by Means of Inhalations of Amyl Nitrite in Large Doses. (*Therapeutische Wochenschrift*, October 20, 1895.) By M. Hayem.

Hayem, in his numerous researches with amyl nitrite on infectious diseases of the respiratory organs, has found that under its use the hæmoglobin is changed into methæmoglobin in the blood-corpuscle without destroying the latter. Much larger doses can be used without danger than has been generally supposed.

The writer has not found this remedy of any value in tuberculosis, but in pneumonia it has given remarkable results. He gives forty-five drops in from three to five minutes, dropping fifteen drops at a time on a napkin and holding it near the mouth and nose of the patient, who inhales deeply.

In many cases larger doses are used, even from sixty to one hundred drops being inhaled without injury. During the inhalation the well-known symptoms appear. One inhalation is usually given daily, but in bad cases the remedy may be exhibited morning and evening. The treatment is carried on during the whole course of the disease and for two or three days after the temperature is normal. Alcohol may be given at the same time. The treatment with amyl nitrite has no marked influence on the duration of the disease nor on the temperature. It has a purely local action, which consists of lessening of the dyspnoea, of making the sputum less tenacious and more fluid, and in alteration of the auscultation sounds. This action is due to the effect of the drug on the circulation in the lung.

A New Astringent, Tannigen. (*La Presse Médicale de Belge*, September 25, 1895.) By D. de Buck, M.D.

To this product, a diacetyl of tannin, Meyer, of Marburg, has given the name of tannigen. It is a yellowish-gray powder, tasteless and inodorous, little or not at all hygroscopic, slightly soluble in water or in acid, but freely soluble in alcohol or in solutions of the phosphate, the carbonate, and the baborate of sodium. The saline solutions of tannigen have distinct astringent properties and precipitate mucin, albumin, and gelatin. The addition of an alkali or of borax redissolves the precipitate and hinders the astringent action.

Meyer's experiments on animals show that the gastric juice has no action upon tannigen, which passes on into the intestine and there exerts an astringent action. A small portion is passed in the fæces, but the larger part is absorbed, and is found in the urine in the form of gallic acid. Clinical results confirm these experiments. The dose is from 0.1 to 1.0 gramme, three times a day. Patients, even nurslings, take the tannigen very readily, and it is borne by the stomach without the slightest inconvenience. Its action in acute catarrhal inflammation of the intestine is more prompt than that of any other like curative agent, and it has a favorable effect in chronic intestinal catarrhs.

SURGERY.

IN CHARGE OF HENRY R. WHARTON, M.D.,

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AND

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A New Method of Performing Nephropexy. (*Revue Médicale de la Suisse Romaine*, June 20, 1895.) By Dr. Vulliet, of Geneva.

The difficulties experienced in nephrorrhaphy from the cutting through

of sutures have led this author, in conjunction with Dr. Pouillet, to attempt to find a tendon in the region of the kidney which could be used to secure the kidney in place. Their experiments upon large dogs resulted in the following method of performing nephropexy, based upon the fact, which they proved, that a tendon is capable of maintaining its vitality so long as one of its insertions remains intact. The operation consists of four stages. In the first the ordinary lumbar incision is made and the kidney is exposed. The wound is then tamponned while the second stage of the operation is proceeded with.

Three-quarters of an inch from the spinous processes of the last dorsal and the first and second lumbar vertebræ, an incision is made three inches in length. This incision passes through the integument, the superficial and the deep fasciæ, which latter is divided upon a grooved director, exposing the tendinous fascia of the spinalis dorsi and its attachment to the first lumbar spine. This tendon is raised upon a grooved director until two fingers can be inserted beneath it, then traction is made upon it gently, but forcibly, until it separates from the muscular attachment higher up. This then forms a cord the size of a large shoe-lace, eight to nine inches in length, having a few muscular fibres at its extremity. In the third stage the lumbar incision is reopened, and the hand in each wound makes bimanual palpation until the tissues are located between the lateral spines of the first lumbar and the twelfth dorsal vertebræ. A strong stylet is then passed through this space and the intervening muscular structures, from within outward, and the tendon is threaded into the eye of the stylet and drawn through into the perinephritic space. In the fourth stage of the operation the kidney is drawn well up into the wound, to facilitate the operation, and the tendon is passed beneath the capsule of the kidney by means of a spatula having an eye. The instrument enters at the upper margin of the lower fourth of the posterior surface of the kidney on the lateral border, and emerges at a point between the upper and second fourths. After the tendon has been passed, its extremity is fastened in the wound by a silver suture, the ends of which, as a matter of precaution, are carried to the skin edge of the wound. For a similar reason, a silver wire is carried beneath the tendon in the other wound and out at the edge of the incision. The wounds are then closed. The course of the healing was uninterrupted; the wound closing in eight days, by primary union. After that time the patient sat up. Seventeen days after the operation the patient walked and was up for a number of hours, made her own bed, and cared for herself without suffering fatigue or pain. A swelling could still be felt in the region of the kidney, which, however, a later examination showed to be inflammatory and not due to the presence of the kidney itself. The kidney was found to be in perfect position and immovable.

Twenty-four days after operation the patient was in perfect condition, without pain, and capable of doing everything. It was impossible to grasp and move the kidney.

The Deformities and Malformations resulting from Acute Infections in Bone. (*Medical Record*, November 2, 1895.) By Roswell Park, M.D., of Buffalo.

That acute inflammation of the structures found in bone is possible, is now a well-established fact. There are three localities in which these manifestations are most commonly met with,—beneath the periosteum, in the epiphyses, and in the diaphyses. These bone-infections are usually caused by one of four organisms, the tubercle bacillus, the staphylococcus, the streptococcus, or the pneumococcus; although in rare instances other organisms are primarily or secondarily present. Of these, tuberculous infection is the most common and is generally not acute; but an acute miliary tuberculosis of bone which corresponds in most essentials to similar invasions of the lungs is found, and is not sufficiently recognized, not being described in even the most recent literature. Its course is not as rapid as the pyogenic infections, and it takes an intermediate position between the latter and the chronic tuberculous lesions. The course of a bone-disease depends, first, upon the location of the lesion, and second, upon its character. If the lesion assumes a very acute type, and if there be prompt evacuation of morbid products, little deformity occurs. If, however, immediate incision is not made, there will be extension of the disease, with destruction of bone and possibly spontaneous perforation with sinuses, through which sequestra may protrude. If the acute focus be located in an epiphysis, the joint soon becomes infected and resection or amputation may be required. Again, the disease may assume a chronic form and be characterized by acute exacerbations. The frequency with which certain bones are involved is due to the rapidity of their growth. According to the investigations of Langer, the coefficient of growth in the femur is 4.38, in the tibia 4.32, in the humerus 3.97, and in the radius 3.83. This scale coincides with the frequency of disease in the bones mentioned,—deformities of bone as a result of inflammation are often found, especially in young children. There may be arrest of growth of the joint end of the bone and compensatory hypertrophy in the other and participating bone; muscle contractures may produce deformity in cases where the interference with joint function has not gone on to complete ankylosis; torsions and flexion may be caused by the pulling of muscles; dislocations and sublaxations may be produced by muscle spasm or by destruction of the ligaments or by epiphyseal separations. Necrosis forms the most common result of osteomyelitis, and may involve the entire thickness of the bone or any portion of it, thus producing a weakening which may lead to fracture, deformity, or curvature.

Alveolar Sarcoma of the Kidney in a Six-Year-Old Child. (*Prager medicinische Wochenschrift*, May 9, 1895.) By Dr. Kopal, of Prague.

A child who complained of abdominal pain was found, by his parents, to be passing very little urine, and later, the presence of a tumor was dis-

covered in the right hypochondrium. Before operation the tumor extended from the right hypochondrium, superiorly to the liver, inferiorly to within three fingers' breadth of the pubes, and to the left to within an inch and a half of the median line, and was completely united to the lumbar muscles on the right side. The surface was nodulated and hard and the percussion note was flat. The patient was anæmic and thin, with normal heart and lungs, and with no fever; but he complained occasionally of pain in the abdomen. The lower extremities were not œdematous. The stools were delayed and the amount of urine markedly reduced. The line of incision for the operation was diagonally from the tenth rib to the symphysis pubis. The posterior layer of peritoneum was divided, externally to the ascending colon, and dissected up. The vessels and ureter were ligated and the tumor was removed; drainage was established both anteriorly and posteriorly. The child had slight fever for two days and after that a normal temperature. There was a noticeable increase in the amount of urine excreted during the day, the amount arising from five hundred cubic centimetres to sixteen hundred cubic centimetres *per diem*. The specific gravity was normal, there was no albumin and no crystals or tube-casts. The child gained rapidly in health, strength, and weight after the operation. The author believes these cases should be operated upon so long as there is no metastasis and the patient is in fair health.

Foreign Bodies in the Œsophagus. (*New York Medical Journal*, August 17, 1895.) By Harrison Allen, M.D.

The author has analyzed eighty-two recorded cases with the object of considering especially the symptomatology and morbid anatomy.

The interpretation of symptoms depends in a great measure upon a correct understanding of the anatomy of the regions through which the œsophagus passes. Four of these regions may be recognized, as, 1, the lower part of the pharynx and region back of the larynx; 2, the portion in the neck between the larynx and the sternal notch; 3, the portion in the chest between the sternal notch and the point of crossing of the œsophagus by the left bronchus; 4, the portion between the left bronchus and the cardiac end.

The left common carotid artery lies on the left side of the trachea, two inches above the bifurcation; the aorta, crossing in front of the trachea and descending on the left side, is peculiarly disposed to hold a foreign body. Both the common carotid artery and the aorta tend to support the left side of the œsophagus, while on the right side there is no such support, the œsophagus projecting slightly to the right of the trachea and lying directly against the pleura.

The following divisions of the subject are recognized: 1, spasmodic constriction of the œsophagus, regurgitation of food, and softening of the œsophageal walls; 2, emphysema; 3, interference with respiration, cough, etc.; 4, excessive mucous secretion; 5, nausea and vomiting; 6, hæmorrhage;

7, anxiety; 8, abscess; 9, emission of air from the œsophagus; 10, pain; 11, convulsions; 12, syncope; 13, miscellaneous.

Spasmodic Constriction.—The contraction of the circular muscular fibres of the œsophagus over the obstructing body and in the fibres for a short distance above and below it induces a constriction which is doubtless the cause of the regurgitation of food. In young subjects especially the violent regurgitation following impaction of the œsophagus is characteristic. This fact is not mentioned by any of the monographers. Softening of the walls of the œsophagus can occur with alarming rapidity, as it offers but feeble resistance to the effects of traumatic inflammation. This is due to the fundamental fact that the canal is one for quick transit.

Emphysema.—Emphysema was found in fifteen per cent. of the entire number of cases. Its existence is of varying significance, but in most cases where it is noticed a fatal result ensues. It usually occurs when foreign bodies are lodged back of the hyoid bone. The point at which air enters the tissues is at the weakest part of the canal,—namely, at the place where the circular set of muscular fibres unites with those of the pharynx.

Interference with Respiration, Cough, etc.—The occurrence of dyspnoea is conclusive that a foreign body is lodged behind the larynx or upper part of the trachea, which is large enough to force the anterior wall of the trachea forward or to make such pressure as to excite laryngitis. Cough is induced by excitation of the mucous lining of the trachea, causing it to pour out an excess of mucus. Aphonia appears to be confined to women, and is doubtless reflex in origin. Hoarseness is usually associated with cough and does not require a separate analysis. Changes in the character of the voice, described as harsh, metallic, or chirping, are noteworthy.

Excessive Mucous Secretion.—This important symptom invariably signifies that in the neighborhood of the mouth and pharynx a foreign substance is exciting the mucous and salivary glands. This symptom is not even mentioned by general writers. It is of special value in determining the location of the foreign body and in making a diagnosis between a foreign body in the œsophagus and the presence of pus back of the pharynx. In the former the mucus is excessive, in the latter it is not.

Nausea and Vomiting.—These are among the most common symptoms of foreign body in the œsophagus. Vomiting as a secondary symptom seems of more serious import than when it is primary.

Hemorrhage.—The occurrence of hemorrhage signifies, as a rule, that the foreign body has caused ulceration of an important vessel or has directly wounded it. The entire percentage in which hemorrhage occurs is twenty per cent. The direction of the flow being upward, the blood naturally escapes by the mouth; but it may trickle into the stomach and cause hæmatemesis, or even bloody stools. Hæmoptysis is rare, only one case being cited.

Anxiety.—Anxiety is a prominent symptom, and Verneuil considers it an important one.

Abscess.—A foreign body in the cervical portion of the œsophagus rarely involves the pericœsophageal structures. In the chest the offending body may make pressure forward. The descending aorta, the left carotid, and the left subclavian artery cause the descending body to be deflected to the right. Hence involvement of the left pleura or left lung is among the rarest of lesions. The right pleural sac or the right lung was involved in eleven cases out of twenty, as shown at the autopsy.

Emission of Air from the Œsophagus.—Belching is a symptom rarely present and of grave significance. In two cases the autopsy showed an œsophageal-tracheal fistula through which air was forced.

Pain.—Poulet asserts that pain in one spot is a most reliable aid in diagnosis. Its locality is not constant. In three cases it was referred to the cervical and dorsal vertebræ; in two it was over the epigastrium; in three back of the sternum; in one at the back of the neck.

The author concludes that “authors of monographs on foreign bodies in the œsophagus have overlooked the rapidity with which softening of the walls of the œsophagus occurs, the significance and value of emphysema, the occurrence of excessive mucous secretion, and the possibility of emission of air; and, in the second place, they have laid too much stress upon pain and convulsion, but not enough, at least in the adult, upon the presence of an anxious expression of countenance.”

NEUROLOGY.

IN CHARGE OF LANDON CARTER GRAY, M.D.,
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On the Epileptic Origin of Ambulatory Automatism. (*Le Progrès Médical*, November 16, 1895.) By Dr. Dezwarte.

The name of ambulatory automatism has been given to the manifestation of certain morbid impulses occurring in neuroses or following cerebral disturbance due to traumatism. The causes, as usually considered, are epilepsy, hysteria, traumatism, and spontaneous or provoked somnambulism. This automatism may be an “epileptic equivalent,” characterized by the unconscious accomplishment of the acts of ordinary life, more or less complicated with impulses to movement and travel. Instead of the impulse to movement taking the place of the convulsive attack (as “equivalent”), it may occur after the convulsion as a part of the epileptic delirium. Often the convulsive attack is replaced by one of ambulatory automatism, and

the same patient may be subject to the two forms at different periods. In the hysterical form also the impulse to movement may precede, follow, or entirely replace the convulsions. This variety, according to Charcot, is related to the spontaneous somnambulism seen in hysterical patients, and is merely the period of "*attitudes passionnelles*" (passionate attitudes) prolonged beyond the ordinary duration. The hysterical patients are not always unconscious during the entire attack, and may be subject to imperative conceptions which force them to accomplish certain things at all costs. The third class, which includes the cases of traumatic amnesia with automatism, is related to the epileptic form. Charcot related the case of a midwife, who, after a fall on the head, performed a delivery while unconscious of her actions during the whole time. These cases may occur some time after a fall on the head which has caused an irritation of the cerebral cortex capable of producing the attacks ("equivalents" of the epileptic attacks). These attacks are repeated thereafter.

It is only the spontaneous, pathological somnambulism pertaining to hysteria which ought to be included in the fourth class. The nature of the natural somnambulism is unknown. After giving this review of the ordinarily accepted forms, Dr. Dezwarte attempts to show that cases considered as hysterical ambulatory automatism are in reality epileptic. The convulsive attacks may be delayed a long time. Three cases are reported in detail. The diagnosis of hysteria has been made in the first case because of certain stigmata, because the attacks of vagabondage are related to spontaneous somnambulism, inasmuch as they present themselves with prodromes comparable to those in attacks of sleep, as they occur in a state of consciousness different from the normal, as the memory of certain actions performed during the attack is lost in the period of wakefulness and can be recalled in the hypnotic state. Dr. Dezwarte, however, believes that the patient is an epileptic. He relies on the history of a fall upon the head, since which time attacks of migraine have been frequent. It is well known that injury to the head may be the cause of epileptic attacks which, in their clinical character and periodic return, do not differ from ordinary epilepsy. He calls attention to the fact that the patient masturbates frequently, as most epileptics do; that he has total amnesia for the entire attack of automatism; that the mental depression preceding the attack in this case is not uncommon in epilepsy and may last several days. He mentions the indifference to fatigue, exposure, discomfort, manifested by the patient during his attacks. In verification of his diagnosis, in later years, true epileptic convulsions have developed. These attacks appear under the effects of hypnotism. The wife of the patient has noticed certain absences (*absentiæ epilepticæ*). The second case offers much similarity to the first. The third case was observed in the service of Professor Lemoine, and is an interesting picture of these strange impulses to vagabondage. It also belongs to epilepsy, according to the opinion of Dr. Dezwarte.

Cancer of the Cerebellum and Cerebrum Metastatic from the Breast. (*Boston Medical and Surgical Journal*, November 28, 1895.) By Edgar Garceau, M.D.

This case was a typical one of cerebellar tumor. The cardinal symptoms—headache, pain in the occipital region, vertigo, vomiting, somnolency, stupor, and choked disk—were all present. But the most surprising feature at the autopsy was the presence of two cerebral growths in addition to the expected cerebellar tumor. One of these was at the posterior portion of the right cerebrum. The other was two and one-half inches anterior to the upper margin of the left Rolandic fissure, and was believed to be the cause of the convulsions of the right arm, right lower limb, and head, which were observed for two days before death. The metastasis was from a right mammary cancer, which had been removed two years previously. Eighteen years before this the patient had had a right mammary abscess.

Concerning a Case of Landry's Paralysis with Determination of Poliomyelitic Lesions in the Nervous Centres due to the Presence of a Microbe. (*Société médicale des Hôpitaux*, October 18, 1895.) By Drs. P. Marie and G. Marinesco.

A young man aged nineteen, a groom by occupation, entered the Hôtel Dieu, Paris, after complaining for fifteen days of general lassitude and rhachialgia, accompanied by all the phenomena which indicate a grave affection. The second night after his arrival an almost complete flaccid paraplegia, with some disturbances of sensation, developed; the latter soon disappeared, while the paraplegia persisted. Once or twice incontinence was observed. The sitting posture could not be maintained. The day following, the muscular force in the right hand was slightly lessened. Three days after admission to the hospital the paralysis in the superior members was evident, especially on the right side. Disturbance of respiration soon followed; the inspirations numbered 40 in the minute and were of the superior costal type. The pulse, which had been 120, became 65, and the temperature sank from 38.5° C. or 39° C. to 37.3° C. The phenomena increased in intensity, and death occurred in syncope seven days after the patient had entered. It was a classical type of Landry's acute ascending paralysis. The autopsy showed hemorrhagic softening, greatest in the lumbar region, involving the gray substance of the anterior horns. The histological lesions were studied by the method of Nissl, and consisted of considerable infiltration in the walls of the vessels in the anterior horns and pial septa. Most of the vessels were very hyperæmic; even hemorrhage was found, as well as foci of inflammation, sometimes in connection with the vessels, sometimes in the interstitial tissue. The alterations in the parenchyma of the anterior part of the gray substance of the lumbar region consisted in necrosis and disappearance of the nervous elements. In the dorsal and cervical regions the nerve-cells presented four grades of degeneration,—

- (a) Degeneration by dissolution of the chromatin.
- (b) Degeneration by rarefaction of the chromatin.
- (c) Degeneration by dissolution of the paraplasma (with fragmentation of the cellular body and its processes).
- (d) Transformation of the body of the nerve-cell into a homogeneous, refracting mass.

The nuclei of the nerve-cells were tumefied, their contour less distinct, the nucleoli not so well colored, and occasionally the nuclei were pushed towards the periphery. Many microbes having a great resemblance morphologically to the anthrax bacillus were found in the dorsal and cervical regions of the cord, and in the bulb and brain. In some places they caused complete obliteration of the vessels.

The authors consider the chief interest of the case as consisting in the following points:

1. In certain forms of Landry's paralysis central lesions relatively gross can be found, contrary to the opinion of those authors who have claimed the existence of peripheral lesions only.

2. Micro-organisms seem in this case to have played the chief rôle in the production of the lesions.

The authors are not able to name the bacillus which they have noticed. All the lesions, hemorrhages, perivascular and interstitial nodules, and degeneration of the nerve-cells, accord well with what is known of the effects of infectious processes in the tissues.

W. G. S.

Treatment of Idiocy by Operation. (*British Medical Journal*, September 28, 1895.) By G. E. Shuttleworth, M.D.

The author's conclusion is that the experience of the last five years does not sustain the sanguine expectation of early operators regarding the beneficial effects of craniectomy in microcephalus. More benefit is to be anticipated from training than from operation, since the condition is generally dependent on faulty intra-uterine brain development rather than premature synostosis. Bourneville has shown that such operations tend even to diminish cranial capacity by exuberant bone-growth at the site of excision. In cases of mental deficiency with traumatic or hemiplegic pressure symptoms, the operation is indicated. In hydrocephalic and hypertrophic cases of imbecility tapping or trephining may be of service.

Diagnosis and Treatment of Epilepsy. (*La Semaine Médicale*, October 16, 1895.) By Gilles de la Tourette, M.D.

The tardy *début* of epilepsy is much more frequent than is usually believed, and the investigation of the anatomical condition has yielded the same negative results as in the form with early *début*. The essential epilepsy develops quite often in persons who have had syphilis ten to twenty years previously, and the mixed treatment has no result, though the bromide of potassium has a favorable influence. This form belongs to

the class termed by Fournier parasymphilitic affections. The pathological anatomy is little known. It is seldom that an epileptic begets an epileptic. Heredity is now considered only a predisposing cause. Injury to the head at birth and infectious maladies of childhood are agents acting by irritation and sclerosis. There are usually slight indications of the disease between the period of these causal lesions and the full development of the attacks. In the tardy form the *début* is often abrupt. The attacks are most common at rising in the morning, occur often also during the night, but are especially rare in the afternoon. A petechial eruption in the cervical region, due probably to extreme vascular tension during the tonic period, should arouse suspicion of nocturnal attacks. In difficult cases of diagnosis between attacks of epilepsy and of hysteria, the urine passed in the twenty-four hours after the attack helps the decision by showing an increase of solids (urea, etc.) in epilepsy, and a decrease in hysteria; also the proportion of earthy phosphates to alkaline phosphates remains unchanged in the former, is changed in the latter. In *état de mal* the temperature rises in epilepsy, and does not exceed the normal in hysteria. The only remedy of value for epilepsy is bromide of potassium, and the dose should never be stopped for a single day during the period of treatment. Give five grammes the first week, six the second, seven the third, and repeat in this order. Let the patient keep the number of his attacks in a book, and compare this with the treatment. Give the bromide so that two-thirds of the dose are taken two or three hours before the customary time for an attack. Always give in very diluted solution. Small doses of salol combined with the bromide are of value. The patient should never be allowed to sleep during the day. The dose of bromide may be diminished after a year and a half to two years in the rate of three, four, five grammes for two months, then two, three, four grammes for two months longer. The bromide must be continued indefinitely if slight symptoms remain, and it is necessary to determine the minimal dose which will prevent an increase in the number of the attacks. In cases where bromide fails to act, borate of soda may be combined with it. Absolute recovery does occur in some cases.

W. G. S.

Infectious Myelitis. (*Gazette des Hôpitaux*, September 5, 1895.) By MM. Grasset, of Montpellier, and Vaillard, of Val-de-Grâce.

M. Grasset does not take into consideration myelitis which is due to syphilis and tuberculosis, and studies the condition from a clinical point of view. He concludes:

1. It appears established that there is a frequent relation of cause and effect between the different infections (small-pox, measles, typhoid fever, gonorrhœa, erysipelas, and streptococcus infection, furunculosis, and staphylococcus infection, diphtheria, dysentery, grippe, pneumonia, acute articular rheumatism, and malaria) and the different forms of myelitis, giving to the word myelitis its most general meaning. This term, myelitis, includes

acute and chronic myelitis, either diffused or systematized. This proposition can only be proved by the study of cases followed by an autopsy.

2. All the infections appear to be able to start up all the different varieties of the diseases of the spinal marrow.

3. The different clinical types of myelitis may be caused by the infectious diseases. The most frequent forms of myelitis observed after the infections are the diffuse myelites, either acute diffuse myelitis (invading or non-invading, in a single focus or in disseminated foci) or chronic diffuse myelitis (in foci or in plates).

4. The clinical history of the infectious myelites does not depend upon the nature of the causal infection. In other words, myelitis may be the same clinically when it follows different infections, and the same infection may develop myelites which are clinically different. The clinical picture depends more upon the seat of the localization of the process upon the spinal marrow than upon the nature of the infection.

5. Since the micro-organisms may act upon the spinal marrow by their presence or by the toxins which they produce, it is difficult to say whether each infectious disease is the direct cause of the myelitis or whether each special affection gives rise to a common secondary affection of the spinal marrow. It is more probable, however, that the common infections (streptococcus, staphylococcus, colon bacillus) are more frequently the direct cause of infectious myelitis than is the character of the original infection.

6. In all cases the etiology of the infectious myelites is complex. The disease requires for its production the combination of an infection with an acquired or inherited neuropathic disposition.

7. The diagnosis, prognosis, and treatment of the infectious myelites depend upon the preceding considerations.

M. Vaillard treats the subject from the stand-point of pathological anatomy and experimentation. Infectious myelites are due either to the invasion of the spinal marrow by a virus which further develops in that situation or to the action of a toxin, secreted in the course of a preceding infectious disease, in an organ other than the medullary axis. In this latter instance the myelitis is caused by an intoxication of bacterial production. Infectious myelites come on unexpectedly at different periods after the infection which has opened a field for itself, and appear to follow either an acute or a subacute course. They may begin upon the complete cessation of complications, but they do not develop in the course of a slowly and gradually progressive chronic disease. The lesions which characterize the infectious myelites are found principally involving the parenchymatous elements, first and foremost the ganglion-cells of the anterior horns. The changes in the nerve-fibres of the white matter are frequent but inconstant; it is difficult to say if they are the result of a simple degenerative process or of a proto-pathic alteration. The neuroglia is usually uninvolved and the vascular lesions are none or, at least, insignificant. The lesions are diffused, but they have a tendency to concentrate in the neighborhood of the enlargements of

the cord. Some infectious agents, such as the virus of rabies and of the venereal disease of the horse, diphtheria bacilli, colon bacilli, streptococci, bacillus pyocyaneus, and the typhoid bacillus, are prone to produce paralyses. The same micro-organisms may give rise to nervous complications of a variable nature. Among animals inoculated in an identical manner with the same infectious agent, all do not ultimately present paralytic complications. Inherent conditions of the subject or of the micro-organisms may render the alterations of the spinal marrow more or less easy; the nervous cells of the different animals are not equally impressionable by the same poison, and, on the other hand, the virulence of the pathogenic agent may be susceptible to the very widest variations. To apply these conclusions to the interpretation of the different myelites observed in man will, perhaps, be premature. Still, it is difficult not to ascribe an infectious origin to infantile paralyses, the invasion, the clinical evolution, the eventual epidemicity, and the lesions of which betray all the characters of an infection. Acute spinal paralysis of the adult is too analogous to that of infancy not to accommodate itself to the same pathogenesis. Acute or subacute myelitis in men presents the greatest anatomical and clinical resemblance to the experimental myelites produced in the animals. Without a primary or secondary infectious process, one is scarcely able to explain those cases which supervene in the course of or at the end of a fever or of an acute disease, be it either so benign or so limited in its localization as gonorrhœa. The appearance of medullary accidents will be at times tardy; and it is in cases in which these accidents begin with all the appearance of spontaneity and without appreciable relation to a recognized infectious malady, or to an infection so small or so masked that it is ignored, that the myelitis appears to be idiopathic. It is difficult to say whether the nervous manifestations depend directly upon the primary infection or upon secondary infections, the intervention of which is so common.

OPHTHALMOLOGY.

IN CHARGE OF CHARLES A. OLIVER, A.M., M.D.,

Philadelphia, Pennsylvania,

AND

EDMUND LANDOLT, M.D.,

Paris, France.

Description of the Method of Operation employed for the Removal of an Epithelioma involving both the Upper and Lower Lids at the Outer Palpebral Commissure. (*Wills Hospital Reports*, vol. i., No. 1, 1895.) By Charles A. Oliver, M.D., of Philadelphia.

The first of the accompanying phototypes very imperfectly represents

FIG. 3.

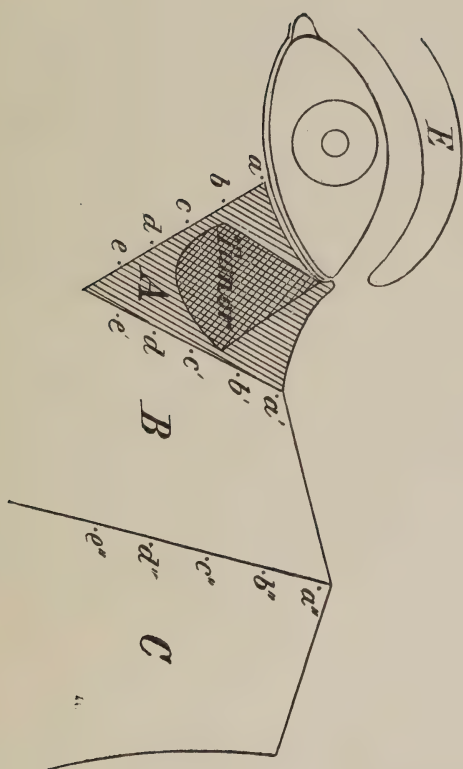


FIG. 4.



FIG. 2.

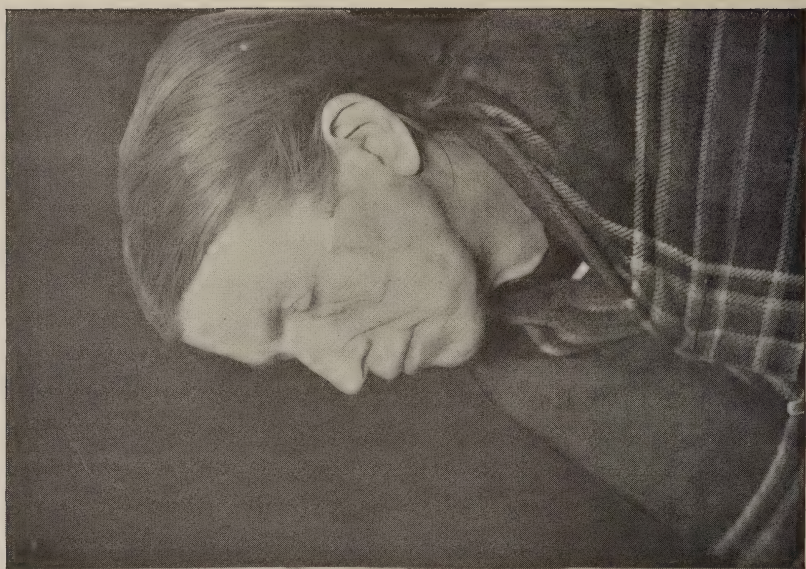
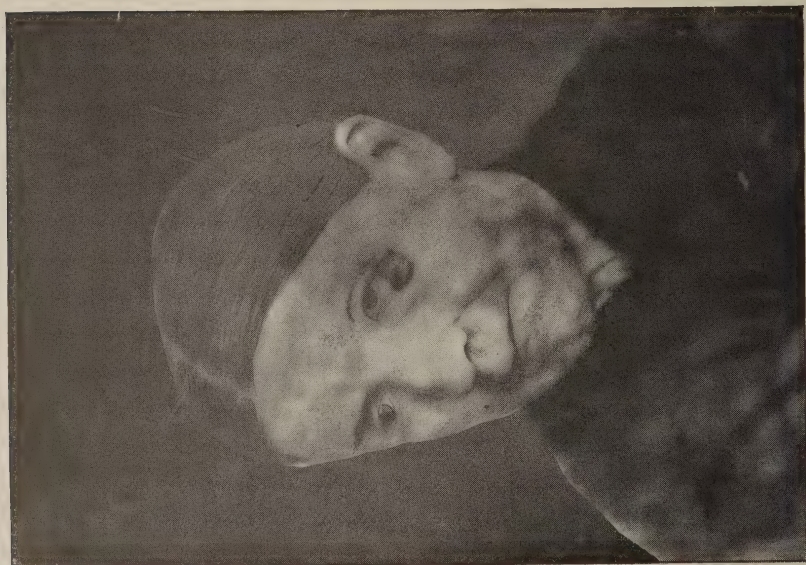


FIG. 1.



the size, position, and appearance of an epitheliomatous growth that was seen and successfully removed by the author.

As can be seen, there was a broad, inverted, kite-shaped tumor occupying the outer portion of the lower lid and extending up into the palpebral commissure. The growth, which was bossellated and firmly attached to the underlying tissues, was occupied by numerous small and several large areas of apparent cystic degeneration.

It will also be noticed that the outer portion of the upper lid was dragged slightly downward and inward, thus hiding the outer angle. The skin of both lids just beyond the ciliary borders was involved at the external angle. The disease did not appear to have invaded the conjunctival membrane. The eye itself was in good condition, and performed all of its functions properly.

While the patient was under the influence of ether, the following operation was performed upon both the upper and the lower lids. As shown in the wood-cut (Fig. 3), the growth included in a large triangular flap *A*, which was so shaped at the outer angle of the eye as to include the entire outer commissure, was first excised. The nasal border of the excised area, *A*, was next dissected sufficiently loose as to allow it some freedom and pliability. After this had been accomplished, the flap *B* was shaped, undermined, and slid over into the position of the previously excised area *A*, and fastened by a series of superficially placed sutures, *a a'*, *b b'*, *c c'*, *d d'*, and *e e'*, and a row of lateral ones placed along the superior border of the flap. In order to prevent the flap *B* from having a raw edge at its outer portion, and to prevent irregular cicatrization near the epitheliomatous area, a second large flap was shaped at *C*. This was carried directly up to the temporal artery, and given a broad base below by carrying the outer incision to the ramus of the jaw. After dissecting the tissues beneath the base of the flap and the adjacent skin around the angle of the jaw, this large flap was slid up and over, and fastened by a series of very superficial sutures *a' a''*, *b' b''*, *c' c''*, *d' d''*, and *e' e''*, and a row of lateral ones running along the upper border of the flap from *A'* to *A''* into the position occupied by the flap *B*. The lower outer portion of the flap *C* was lifted up and fastened in position by three deep sutures, thus leaving but a small triangular granulating area just in front of the ear. After the lower flaps had all been secured in proper position the tongue-shaped flap *E* was carefully dissected loose and freed. The point *B* (Fig. 4) was then twisted down and out, and fastened by a strong deep suture to the point at the external commissure, and the flap was stitched into its new situation by several superficial sutures. During the procedure there was profuse bleeding, which was arrested by heat and by torsion of the bleeding vessels. Each flap was made as thin and as clean-edged as possible. All adherent fat was excised. The flaps were kept warm by hot sponges, and the exposed raw surfaces were cleaned and freed from all blood-clots before the flaps were sutured into position. The entire operative field was dusted

with powdered iodoform, and the external surface was covered with anti-septic gauze and bandaged.

On the second day, the dressings were removed, and the flaps were found to be in excellent condition. The triangular free space in front of the ear was beginning to granulate. Two days later, the stitches in the upper lid and all the lateral stitches of the vertical rows of sutures were removed.

On the sixth day, a small area at the inner part of the lower portion of the large outer flap appeared somewhat tumefied. This was excised, giving egress to some pus. The cavity was cleaned, and allowed to heal by granulation. The upper stitches were removed. The flaps were thoroughly healed, and the granulating area in front of the ear was well filled with healthy tissue. There was no cicatricial dragging around the lids themselves. The external commissure had become as well shaped as its normal fellow, and the lid-movements were undisturbed in any way. Two weeks after the operation the granulating area had almost healed. One week later, but three weeks after the operative procedure, the patient was discharged cured. Fig. 2 shows the condition of the flaps some four months after the operation. At the present writing of the abstract, sixteen months after the operation, the scars are less visible, and, in fact, can barely be distinguished from the natural folds and creases of the skin.

Latent Astigmatism. (*Journal of the American Medical Association*, November 16, 1895.) By Horace M. Starkey, M.D., of Chicago.

Believing that this form of astigmatism plays a much more important rôle in the production of asthenopia than is usually supposed, the author has summarized his findings, with those of others, into the following:

1. Latent astigmatism is a frequent and important cause of asthenopia.
2. The latent astigmatism may in many cases be made manifest without a cycloplegic, and without interfering with the patient's business, by giving lenses which correct the manifest error, which may be worn a day or two, when an additional amount of astigmatism will be manifest, which may be corrected in the same way, and so on till all the latent trouble is unmasked.
3. This may be done without discomfort to the patient, and is therefore advantageous with the sceptical, irritable, and nervous.
4. Recent text-books do not give this subject the attention its importance deserves.
5. Astigmatism may be latent whether the axis of greatest curvature is vertical, horizontal, or diagonal.

OBSTETRICS AND GYNÆCOLOGY.

IN CHARGE OF RICHARD C. NORRIS, M.D.,

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AND

LAWRENCE S. SMITH, A.B., M.D.,

Instructor in Clinical Gynæcology in the University of Pennsylvania.

A Contribution to the Knowledge of Primary Tuberculosis of the Ovarian Tubes. (*Monatsschrift für Geburtshülfe und Gynäkologie*, 1895.) By E. G. Orthmann, M.D., of Berlin.

After an exhaustive reference to the literature on the subject of tuberculosis of the genital organs, in which sixty-eight authors are quoted, Orthmann describes very carefully two cases that came under his observation within the past year. The first was one of primary, double, tubal tuberculosis with secondary infection of the uterus. In the second case the uterus had not become involved. In both the operations were successful. As a result of his own experience and that of the other authorities Orthmann comes to the following conclusions:

1. Of the sexual organs in woman the ovaries and tubes are the ones most frequently attacked primarily by tuberculosis.
2. Primary tubal tuberculosis occurs in eighteen per cent. of all cases of tuberculosis of the female genital tract.
3. Sexual intercourse, labor, and the puerperium predispose to the infection and favor its rapid development.
4. Secondary infection from the tubes takes place most frequently in the peritoneum, next in the uterus, and then of the sexual organs, in the ovary. Ascites occurs relatively seldom, fifteen per cent. of the cases.
5. A positive diagnosis is possible in few cases. It can be made earliest when a simultaneous involvement of the uterus is manifested in the discharges or in fragments curetted from the endometrium.
6. Therapeutically, the diseased tubes should be removed as early as possible. If the uterus has become involved curettage followed by an application of caustics may be sufficient unless the muscular wall has become involved, in which case a complete hysterectomy is required.

What Factors are to be regarded in the Disinfection of the Hand. (*Monatsschrift für Geburtshülfe und Gynäkologie*, Bd. i., Heft 3.) By F. Ahlfeld, M.D.

The discussion over the paper of Reinicke, read before the *Leipziger Gesellschaft für Geburtshülfe*, led Ahlfeld to undertake a series of experiments to determine the effectiveness of the ordinary method of disinfecting the hands. As a result of one hundred and twenty-two experiments made on seventy-five different individuals he reached the following conclusions:

1. An essential factor in the success or failure in disinfecting the hands is their previous condition. Hands with long nails, deep grooves around the edges of the nails, and rough, fissured skin are very difficult to sterilize.

2. A second factor is the energy, both physical and mental, with which the disinfection is conducted.

3. In the sterilization, alcohol plays the most important rôle, on account of its germicidal action.

4. The operation should begin with the trimming of the nails. Then the hands should be scrubbed one or two minutes with soap and hot water. After the nails have been carefully cleaned the scrubbing should be continued again for one or two minutes. The water should be very hot and changed frequently during the process.

Careful observation of these points produced satisfactory results in all the experiments.

Lesions of the Fœtus in Eclampsia. (*Revue des Maladies des Femmes*, October 25, 1895.) By MM. Cassaet and Chambrelent.

These authors have made a histological examination of the kidneys and spleen of still-born infants of eclamptics and of children born of eclamptics who died soon after birth. Death was found to be due to two very different causes: 1. To hemorrhagic and degenerative lesions of the placenta; in these cases the fœtus died *in utero* and was often macerated at birth. 2. To histological alterations of the spleen and kidneys, resembling the lesions found in the organs of the mother. These lesions explain the great mortality in the infants of eclamptics, even when they are born living and well-developed.

In Regard to the Destruction of the Endometrium after Curettage. (*Centralblatt für Gynäkologie*, No. 36, 1895.) By J. Veit, M.D.

Veit reports a case similar in many respects to those reported by Fritsch and Küstner. The patient, a married woman, pregnant after a considerable period of sterility, had aborted incompletely and had been curetted three days afterwards. After that menstruation ceased for several months, and the woman supposed she was pregnant again. An examination, however, showed the uterus slightly longer but scarcely thicker than normal. A sound passed readily into the cervical canal for two centimetres, but could not be forced any farther. The canal ended abruptly at the internal os. By dilating the patulous portion of the cervix with a tent, Veit was able to stretch the occluded portion sufficiently to admit a fine probe. After treatment for six weeks he was able to establish a passage two millimetres in diameter through what proved to have been an adhesion of the uterine wall about one centimetre in width. Menstruation was re-established and has continued regularly every four weeks. The cases of obliteration of the uterine cavity so far reported have all occurred in puerperal uteri, and Veit thinks it almost impossible to remove the mucous membrane in the

non-puerperal condition so completely as not to leave enough remains of the glandular structures to reproduce the endometrium. In the puerperal uterus the conditions are quite different. The relaxation of the muscular wall no longer affords the protection to the deeper portions of the mucous membrane, and it would appear quite possible to remove every trace of it within a greater or less area, and, in case two such areas were brought in apposition, to have quite extensive adhesions constricting or even obliterating the cavity. He, therefore, advises against the thorough curetting of the puerperal uterus and favors the use of the fingers after the cervical canal has been fully dilated.

PATHOLOGY.

IN CHARGE OF ALLEN J. SMITH, A.M., M.D.,

Professor of Pathology in the Medical Department of the University of Texas, Galveston, Texas,

AND

HENRY W. CATTELL, A.M., M.D.,

Demonstrator of Morbid Anatomy in the University of Pennsylvania; Prosecutor to the American Anthropometric Society; and Pathologist to the Presbyterian Hospital, the Institution for Feeble-Minded Children at Elwyn, etc.

Multiple Tumors of the Brain; Fibro-Cystoma of Pons and Cerebellum, and Multiple Fibro-Psammomata of Dura, Pia, Arachnoid, and Cortex Cerebri. (*Brain*, Part lxxii.) By F. W. Langdon, M.D., of Cincinnati.

The patient, a woman, thirty-two years of age, had, seven years previous to death, an attack of "cholera morbus," which was followed by more or less ill health described as nervous trouble. In November, 1890, her physician reports a chronic aural catarrh, not relieved by treatment and accompanied by sick headaches. In February, 1892, a marked papillitis of both eyes appeared. When next seen, January, 1895, the central vision was normal, but there was paresis of the right abducens with diplopia on the right side. The writer gives the prominent features of the case, when seen by him thirty-nine days before death, as follows: Violent paroxysmal pains in head, hyperæsthesia over right side of scalp, diplopia, bilateral deafness, left hemiparesis, and vomiting *with nausea*, optic neuritis, and paralysis of the abducens. From these symptoms a diagnosis was made of a tumor at the base of the brain on the *right side*, probably pressing on the pons Varolii, and involving the fourth, fifth, seventh, and eighth nerves, or their nuclei. No one cortical lesion could account for all the symptoms presented, but the absence of convulsions, monoplegia, or mental impairment seemed to exclude an extensive or multiple cortical involvement.

The autopsy revealed an ovoid neoplasm the size of a kidney-bean enclosed within the layers of the falx; a second, half the size of the first, situated at the superior margin of the falx; three similar growths projected from the inner surface of the dura of the convexity over the posterior ex-

tremity of the first and second frontal convolutions; a sixth protruded from the under surface of the dura at the right of the great longitudinal sinus; a seventh was enclosed in the meshes of the pia just anterior to the lamina cinerea; and the eighth and principal tumor came into view on dividing the tentorial attachment at the petrous margin. It was about the size of an English walnut. The left cerebellar hemisphere and the left half of the pons were compressed and atrophied, and the left flocculus was flattened and continuous with the under surface of the growth. The cranial nerves in apparent relation with the growth were the left fifth, sixth, seventh, and eighth. The ninth, tenth, and eleventh emerged normally, a few fibres entered the substance of the tumor, and the remainder disappeared at a point where the surface of the growth was broken into perhaps a hundred miliary nodules. The left twelfth was probably subject to mechanical pressure.

The author gives an analysis of the symptoms in the light afforded by the autopsy. The slight effects of so serious a lesion are due probably to the extremely gradual progress of the growth, allowing time for a considerable degree of accommodative adjustment on the part of the tissues involved. The implication of cranial nerves corresponds to the anatomical situation of the growth, with the exception of the fourth and fifth. The fourth was not involved, and the diplopia, which was the apparent result of its impairment, must be attributed to involvement of co-ordinating fibres by which harmony of action is brought about between the nuclei of the third, fourth, and sixth nerves. Although the fifth was seriously injured, sufficient fibres to carry on the function evidently escaped degeneration, as hyperæsthesia, anæsthesia, trophoneurosis of the left face, etc., did not occur. The right-sided hyperæsthesia over the forehead and scalp may be explained by the pressure exerted by the tumor from the left towards the right upon the right fifth nerve. The bilateral deafness was due to two factors,—first, the direct involvement of the left acoustic nerve; and, second, pressure on the pons affecting the fibres from the right nuclei in their course towards the cortex, through the pons, crus, and internal capsule. The absence of complete facial paralysis is explained by the fact that some fibres of the *portio dura* maintained their power of conduction. The left motor paresis was apparently due to pressure on the pyramidal fibres after their crossing. The vomiting preceded by nausea, contrary to the rule in cerebellar vomiting, would perhaps indicate that involvement of the vagus trunk or its nuclei was the cause. The relief from severe intracranial pain obtained by assuming a semi-opisthotonic position was due to partial removal of the weight of the brain-mass from the tumor, and especially from the left fifth nerve.

History and Post-Mortem Examination of a Rabid Dog. (*Pittsburg Medical Review*, November, 1895.) By J. Stewart Lacock, M.D.

The dog seemed to be sick about a week after fighting with a dog from

a neighborhood where several animals had died of suspected rabies, and ten days later he stopped eating, became nervous and uncontrollable, barked peculiarly, snapped at imaginary objects, and urinated very frequently. A veterinarian examined the dog and pronounced the disease as likely to be rabies. While being chloroformed the animal caught a man's hand and inflicted several lacerated wounds. It died the following day.

On post-mortem, the tongue and pharynx were found swollen and inflamed, the kidneys congested, the membranes of the brain congested, especially over the middle lobe of the cerebellum, the posterior extremity of the interhemispherical fissure, and the extreme posterior portions of the hemisphere of the cerebrum.

A portion of brain-tissue from the inflamed area was inoculated under the dura of a rabbit. It died rather suddenly of paralysis about fifteen days after inoculation. A second rabbit, inoculated from the brain of the first, died in the same manner. The cerebral tissues and membrane around the site of inoculation were congested in both cases.

BOOK REVIEWS.

THE INTERNATIONAL ENCYCLOPÆDIA OF SURGERY. Edited by John Ashhurst, Jr., M.D., LL.D. Vol. VII. (Supplementary Volume.) New York: William Wood & Co., 1895.

The object of this supplementary volume, as stated by the author, is to furnish the readers of the International Encyclopædia with an account of such additions as have been made to the science and art of surgery since the original work was published. In the seven years that have elapsed since the publication of the revised edition of the original work many of the authors have died, and the editor has exercised great judgment in the selection of authors to revise these articles. The well-earned success which was accorded to the original work naturally excited an unusual amount of interest in the present volume, and after a careful study of the various articles we cannot but feel that the authors have fulfilled the difficult task of bringing the various articles up to date in a most satisfactory manner. The reader will sometimes be disappointed in the shortness of some of the articles, but in these cases, on reference to the original article, it will usually be found to have been very fully presented, or that little new matter has been brought before the profession since its publication. On the other hand, some of the supplementary articles contain more matter than the original ones; this is notably the case in the article upon Cerebral Surgery.

The majority of the articles can justly be said to represent the most widely accepted and modern opinions upon their respective subjects, and as such cannot fail to be fully appreciated by the judicious reader. Among those which have impressed us most favorably are the articles by Ernst, on Inflammation; by Kammer, on Wounds and Wound Treatment; by Kiliani, on Diseases Complicating Wounds; by Curtis, on Tumors; by Nancrede, on Injuries and Diseases of Bursæ and Injuries of

the Head; and those by Dulles, Ashhurst, Keen, Lovett, Neilson and Davis, Harte, Forchheimer, and Ransohoff. We congratulate the editor, whose masterly editorial skill has brought to a successful completion this great work upon surgery. We feel sure that those who possess and appreciate the value of the original work will increase its value by the acquisition of the present volume, which may be considered a concise and reliable exposition of the surgery of to-day.

H. R. W.

DA COSTA'S MEDICAL DIAGNOSIS. Eighth edition. Revised. Philadelphia: J. B. Lippincott Company, 1895.

This book is well known to both the student and practitioner of medicine, for it is now thirty-one years since the first edition was issued; since that time it has been translated into many languages for use as a text-book, while in this country it has always remained a standard work on diagnosis.

The present edition, the eighth, maintains the former favorable impression of its worth: the writer possesses that happy faculty of grouping together kindred diseases, and with few words throws the full light of differential diagnosis upon them: the description of disease is concise, accurate, and frequently picturesque. Certain it is that it makes pleasant reading and enjoyable study.

Dr. Da Costa has advanced with the progress of medical science; he is ready to accept the more recent discoveries in bacteriology, or at least to give them due trial. The tubercle bacillus, the bacillus coli communis, the amœba coli, the plasmodium malarie, the pneumococcus, the diphtheria bacillus, are all given their due place as causative factors in the production of disease.

The most extensive chapter in the book is that on Diseases of the Brain and Spinal Cord: the great strides made in this direction have necessitated much new material in the later edition: much space is also devoted to Diseases of the Lungs. This chapter reads well, and is one from which the younger man can gain many valuable hints in diagnosis.

Your reviewer has but few criticisms to make upon this work: the most of them concern disease of bacterial origin, about which there still exist reasonable doubts in the minds of some writers.

Dr. Da Costa would separate tuberculous and scrofulous infiltration of the lungs (page 384) from one another: he states that he has not yet seen reports of cases in which the tubercle bacilli were found in the latter condition: it is now generally acknowledged that the conditions are due to the same cause, though the channel of infection differs.

On page 343, it is stated that the tubercle bacillus is equal in length to the diameter of a red blood-corpuscle; it is really but one-third or one-fourth of the diameter. The red blood-corpuscle averages from six to seven μ in diameter, and is our standard of size for comparison of bacilli; the tubercle bacillus is from one and a half to three and a half μ in length.

He differentiates diphtheria from membranous croup and does not consider the latter contagious (pages 351, 352). Pathologists are now agreed that the course of these two conditions is identical, but that the dissimilarity of tissues accounts for the symptomatic and systemic differences.

The reader will not find in this book minute directions for the performance of all clinical laboratory work; he will find the more important methods for staining pathogenic micro-organisms in the blood, tests for the gastric contents, for the urine, etc., but they are not given in detail, so that a beginner might utilize them. Some recent books on medical or clinical diagnosis are better in this respect; but a more beautiful description of disease, with its subtle array of confusing symptoms, one cannot find elsewhere than in this volume. The printing is excellent; the illustrations, though rather limited in number, are mainly original and good.

J. A. S.

PÆDIATRICS: THE HYGIENIC AND MEDICAL TREATMENT OF CHILDREN. By Thomas Morgan Rotch, M.D., Professor of the Diseases of Children, Harvard University. Illustrated. Pp. 1124. Philadelphia: J. B. Lippincott Co., 1895.

It is with sincere pleasure that we examine this volume, the appearance of which has been so long expected. There has been no work of anything like its size and scope from the pen of any one American author since the appearance of the well-known text-book of J. Lewis Smith. Dr. Rotch's prominent position in the pædiatric world and the quality of his writings heretofore lead us to expect a production which shall be a valuable addition to medical literature; and in this expectation we are in no way disappointed. The work is a thoroughly scientific one, and, what is even more apparent, one which bears the stamp of decided originality. The illustrations with which the book is well provided are nearly all original. There are detailed, too, a large number of cases seen by the writer. Such detailed cases are, we think, always of great service, since they impress better than by any other means the statements made. The text is in the form of a series of lectures addressed to a class. We regret this, but this is the only criticism we have to make; for, although this style adds to the interest in reading, it detracts from conciseness and from convenience for ready reference.

The first chapter discusses the infant at term, and those chapters immediately following discuss the normal development of the child; all showing a great deal of care in preparation. Here the reader will find a grouping of facts which he will seek for in vain in other books on pædiatrics. The next chapter, on the hygiene of the nursery, likewise contains many facts usually omitted from text-books of pædiatrics, but the knowledge of which is not the less needed by physicians. The chapter on feeding is large. The author here expresses in full his views upon the subject with which his published writings have already made us acquainted. Among other things he gives a description of a milk laboratory. This will be useful to the many not familiar with this method of preparing food for infants, which is becoming rapidly popular.

The remainder of the volume can hardly be reviewed in detail. We may call especial attention to the chapters on the blood and its diseases, the diseases of the new-born, and the diseases of the gastro-enteric tract. In the latter chapter the author presents the system of classification adopted provisionally by the American Pædiatric Society,—a classification intended to simplify the study of diseases of this nature and its complicated nomenclature. The arrangement, as stated, is provisional and by no means perfect, and will doubtless be modified later, yet it is a step in the right direction.

We have already referred to the illustrations of the volume. Among these are a large number of reproductions of photographs. We note also eight colored plates very well executed.

J. P. C. G.

A GUIDE TO THE PRACTICAL EXAMINATION OF URINE, FOR THE USE OF PHYSICIANS AND STUDENTS. By James Tyson, M.D., Professor of Clinical Medicine in the University of Pennsylvania, and Physician to the Hospital of the University; Physician to the Philadelphia Hospital; Fellow of the College of Physicians of Philadelphia, etc. Ninth edition. Revised and corrected. With a colored plate and wood engravings. 12mo. Pp. 276. Cloth, \$1.25. Philadelphia: P. Blakiston, Son & Company, 1895.

The value of this work to the general practitioner and student is attested by the fact that it has already passed through eight editions, and this, the ninth, comes to us enlarged by additions which bring the volume up to date. While it is of advantage to the general practitioner and to the student, the book is also of practical benefit to the specialist and to the advanced student of urinalogy. The methods for

performing the complicated analyses for the detection of such substances as pepton and aceton are given clearly and accurately, so that the book is an important laboratory guide. Perhaps, in a future edition, it would be well to add the methods for detecting xanthin, hydroxanthin, and other leucomaines, the significance of which in producing migrane, gastric neuroses, and reflex epilepsy has recently been pointed out by Rachford, of Cincinnati. A French translation of the work has just appeared in Paris, under the editorship of Drs. Gautrelet and A. S. Clarke.

J. M. S.

BOOKS RECEIVED.

WILLIAM WOOD & CO., NEW YORK.

THE INTERNATIONAL ENCYCLOPÆDIA OF SURGERY. Edited by John Ashhurst, Jr., M.D., LL.D. Vol. VII. Supplementary volume.

OLIVER & BOYD, EDINBURGH.

NOTES ON SURGERY FOR NURSES. By Joseph Bell, M.D., F.R.C.S. (Edin.), Consulting Surgeon to the Royal Infirmary, and Surgeon to the Royal Edinburgh Hospital for Sick Children. Fourth edition, thoroughly revised. With an additional chapter of General Advice to Nurses. 12mo. Pp. 180. Cloth, 2/6.

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SPECTACLES AND EYEGLASSES; THEIR FORMS, MOUNTING, AND PROPER ADJUSTMENT. By R. J. Phillips, M.D., Adjunct Professor of Diseases of the Eye, Philadelphia Polyclinic and College for Graduates in Medicine; Ophthalmic Surgeon to the Presbyterian Hospital in Philadelphia. Second edition, revised. With 49 illustrations. 12mo. Pp. 100. Cloth, \$1.00.

THE JOHNS HOPKINS PRESS, BALTIMORE.

THE JOHNS HOPKINS HOSPITAL REPORTS. Report on Pathology, IV. Deciduoma Malignum. By J. Whitridge Williams, M.D.

TRANSACTIONS.

TRANSACTIONS OF THE TEXAS STATE MEDICAL ASSOCIATION, TWENTY-SEVENTH ANNUAL SESSION, Dallas, Texas, April 23, 24, 25, and 26, 1895. Publication Committee, H. A. West, M.D., H. P. Cooke, M.D., and David Cerna, M.D.

ITEMS OF INTEREST.

THE following prizes will be awarded by the Royal Academy of Medicine of Belgium. First, a prize of five hundred francs for "the chemie and microscopic study of the plants of the family of solanaceæ employed in medicine and of their products used in pharmacy." Those competing will lay stress upon the methods of dosage of the active principles contained in these drugs. The competition for this prize will be closed on the 20th of June, 1896. Second, a prize of one thousand francs will be awarded to the author of the best essay upon "the rôle of the wandering cells coming from the blood and from the lymph in the organization of the tissues of warm-blooded animals." Essays must be received before the 15th of November, 1896. Third, a prize of eight thousand francs, offered by an unknown benefactor, will be awarded for the best essay which will "elucidate by clinical facts and by experiments the pathogenesis and the therapeutics of diseases of the nervous centres and principally of epilepsy." This competition closes the 15th of September, 1899. As encouragements, from three hundred to one thousand francs will be ordered for those authors who shall not deserve the prize, but whose works shall be considered worthy of a recompense.

A sum of five thousand francs and one of twenty-five thousand francs will be given, besides the prize of eight thousand francs, to the author who shall have realized the highest progress in the therapeutics of the diseases of the central nervous system; such will be, for example, the discovery of a curative remedy for epilepsy.

The prize of seven hundred and fifty francs, founded by Dr. Da Costa Alvarenza, will be awarded on the 15th of January, 1896. Manuscripts

in competition for this prize will be received up to that date. According to the terms of the will of M. Alvarenza the interest of the capital shall constitute an annual prize which shall be called The Alvarenza Prize of Piahy (Brazil). This prize will be given, on the anniversary of the death of the founder, to the author of the best unpublished memoir or work, the subject of which shall be of the author's choice, upon any branch of medicine, which work shall be deemed worthy of recompense, after an annual competition has been established and followed by the examination of the works sent in accordance with the rules of the academy. If none of the works are deemed worthy of recompense, the value of the prize will be added to the capital.

The conditions of the competition are as follows: Active and honorary members of the academy cannot take part in the competition.

The memoirs, legibly written in Latin, French, or Flemish, should be addressed to the secretary of the academy, Brussels, post-paid.

The following are excluded from the competition:

1. That memoir which does not fulfil the preceding conditions.
2. Those memoirs the author of which is either directly or indirectly made known.
3. Those which have been published in whole or in part, or which have been presented to another scientific body.

The academy requires the greatest exactness in respect to quotations; thus, that mention be made of the edition and of the page of the original text.

The memoir for the competition and the sealed envelope, in which the name and address of the author are indicated, should bear the same inscription. Pseudonyms are prohibited.

The envelope accompanying the successful work is opened by the president in public meeting.

When the academy accords only a recompense for a memoir, the envelope which accompanies that memoir is only opened at the request of the author. This request should be made within six months. After the expiration of that time the honorarium is not awarded.

The manuscript submitted in competition cannot be reclaimed; it is deposited in the archives of the college. The author may always have a copy of his work made by one of the employés of the secretary of the academy after the announcement of the result, at his own expense.

The academy awards, gratuitously, fifty copies of the memoir which it has ordered printed to the author, and gives him the opportunity of obtaining a larger number at his own expense.

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